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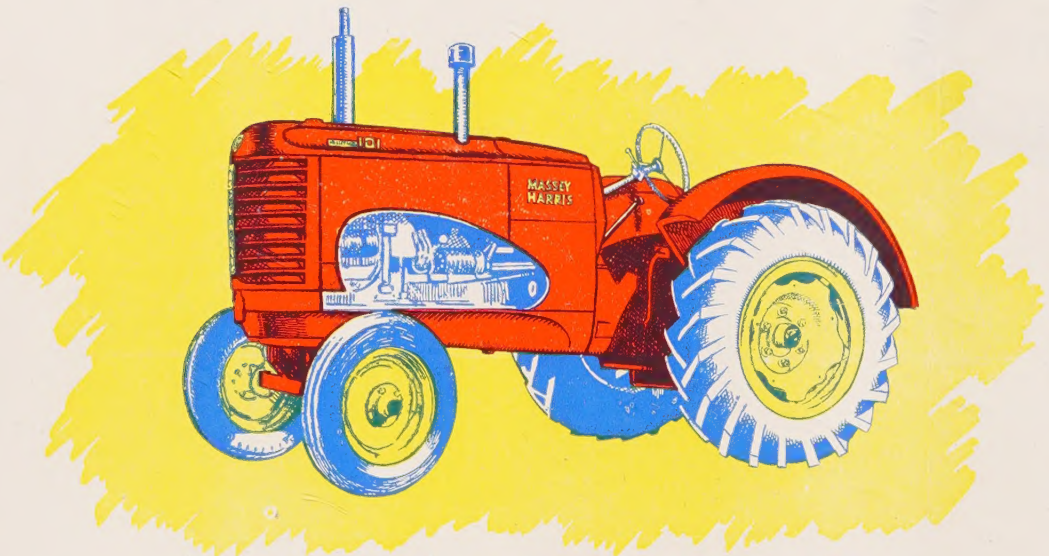

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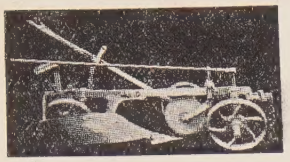

JOURNAL OF AGRICULTURE

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First Aid to Farm Stock

Although every farmer hopes to avoid serious losses in his animals through disease or accident, there are occasional injuries and illnesses sustained by animals which no amount of care will prevent. Some of these may require the attendance of the local veterinary surgeon, but many are of a minor nature which can be attended to quite successfully by the farmer himself. Even in the more serious cases it is as well to know what preliminary treatment to undertake in the interval before the veterinary surgeon arrives, provided that his calling to the case is not postponed until the animal is past all help.

— By —
G. A. THOMSON, M.R.C.V.S.,
Veterinarian, Auckland.

THIS article discusses some of the simpler troubles such as cuts and galls, foot injuries, torn teats, and eye injuries. A few simple instruments are necessary in the farm first-aid kit—a good, sharp knife, a sharp pair of scissors, a small pair of forceps, and a needle or two. These should be kept together in a clean box or tin, and should not be used for anything but first-aid work. When required for use, no matter how clean they look, they should be boiled or soaked in a strong disinfectant solution.

A recommended supply of commonly-used antiseptics and medicines is:—An 8oz. bottle of iodine; 1lb. of boracic acid powder; copper sulphate (better known as bluestone), which may be required in small or large quantities, depending on the condition to be treated; a small bottle of Condy's crystals, called potassium permanganate by chemists, and a tin of a reliable antiseptic or one of the eucalyptus preparations. I think it is better to buy a gallon tin of these antiseptics than to rely on a small bottle, which costs relatively more and which is often empty when required. A few pounds of epsom salts, raw linseed oil, Stockholm tar and molasses, and a few bandages and clean rags should complete the list.

Restraining Patients

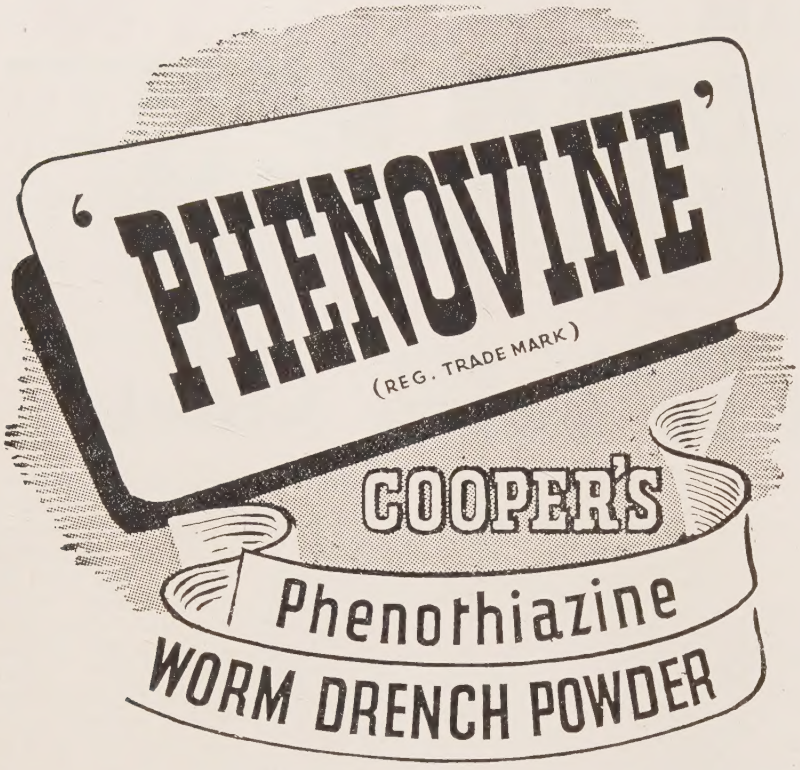
Before introducing the first casualty it is necessary to lay down a few rules of general procedure. Firstly, the animal should be restrained so that it is easy and safe to proceed with treatment, for while it may be possible to treat an injury with the animal uncontrolled, it is rarely possible to treat it well. Take, for example, a horse which has been mixed up with some barbed wire. It won't stand for its skin cuts to be treated unless a good headstall is provided and perhaps a rope to pull up a leg. A twitch on the lip or a blind over the eye is often useful.

Very often a cow must be thrown before it is possible to apply treatment. Those not familiar with the easy method, that is, a rope looped first around the neck, then behind the shoulders, and again in front of the hips, and pulled from behind, should have it demonstrated.

Treating Wire Cuts

The main essentials, whether the patient is a horse, cow, dog, or pig, are cleanliness and disinfection, stoppage of bleeding, and aids to natural healing. In treating wire cuts first clean the wound, using cotton-wool, or a clean cloth soaked in the disinfectant solution, which may be prepared from Condy's crystals, a reliable antiseptic, or a solution of 1oz. of common salt in about three-quarters of a gallon of warm water. Hydrogen peroxide is very useful where particles of dirt or hairs have entered the wound, particularly if the wound is a deep one. Powdered sulphanilamide is probably the best thing to use but is not always available at present.

Next clip the hair with the scissors as short as possible for a distance of an inch or two around the wound, taking care that the hairs do not fall into the wound. If bleeding has not stopped by this time, take a clean pad of cotton-wool or cloth soaked in cold water and press gently but firmly on the wound for sufficient time to stop the bleeding. If you cannot stop bleeding in this way, there is probably a torn blood vessel which needs to be tied. Unless you have had experience with such cases it is best to send for the veterinarian. When the wound is clean and all bleeding stopped, all that remains to be done is to bring the skin edges together, if necessary, with a stitch or two placed directly across the lips of the wound. These should be tied just sufficiently firm to hold the edges together. If too tight, they delay healing by compressing the blood supply, while if too loose, dirt will get in again. Do not stitch the wound unless it is necessary, as in many cases it will heal up better



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without such aid. It is usually impossible to bandage wounds except on the lower part of the legs, and in any case a bandage is of use only to keep the wound clean. Sometimes sticking plaster applied over a piece of lint will keep things clean. A gentle application of disinfectant should be made once a day until healing is well advanced. If stitches have been necessary, they can usually be removed after four or five days, unless the wound is extensive, in which case they should be removed a few at a time according to the degree of healing.

Eye Troubles

A complaint with which practically all horsemen and many dairymen are familiar, a small piece of chaff or other material in the eye, can do a great deal of damage if left unattended. It may lead to permanent blindness or bursting of the eye, and even in mild cases causes considerable distress to the animal. Often the first symptoms seen are a watery discharge down the face from the eye, frequent blinking, and redness of the surface of the eye. Sometimes the cause of the trouble is difficult to see, as the animal may object to any manipulation of the eylids, and the offending matter may be well in under the eyelid. If found within a day or two, it is easily removed, either by flushing out the eye with a solution of boracic acid or by catching it on a camel-hair brush or other soft-ended instrument. Sometimes when castor oil is poured into the eye the chaff will be gradually pushed out or may be removed easily the following day. When it has been in place for a few days it becomes firmly attached to the eyeball, and covered with a fine layer of mucus which makes it impossible to brush or wash out. If this has happened, obtain a small bottle of 1 per cent. solution of silver nitrate or zinc sulphate from the chemist and pour a few drops into the eye each day until the chaff is loosened. Continue to bathe the eye for a few days afterwards until all signs of inflammation have disappeared.

The treatment just described should be used for any simple inflammation of the eye, such as "pink-eye" in sheep and cattle. If, however, the inflammation becomes serious and there is an obvious whiteness within the eyeball, or very marked inflammation of the membranes, it would be advisable to call in the veterinarian immediately.

Treating Horses' Feet

Foot troubles in horses are mostly injuries caused by picked-up nails or other sharp objects, while in cattle and sheep footrot and foot abscess cause a lot of trouble. While most horsemen have little difficulty in diagnosing lameness due to foot injury, the main signs being resting the leg, holding the foot off the ground, heat in the hoof, and pain on application of pressure, many have great difficulty in finding the actual injury. For this reason treatment by the farmer himself without plenty of experience is not recommended; better to call in a veterinarian, or, if he is unavailable, to obtain the help of someone experienced in the work. If the job must be done without veterinary assistance, adopt this procedure. Ascertain where the pain is most pronounced by tapping with a hammer or squeezing with pincers. Remove the shoe carefully, examining each nail to see if there is any sign of blood or pus either on the nail or in the nail hole. If there is no obvious injury, you must gradually pare the sole of the foot in the area suspected to be involved with a hoof knife. In these cases the injury is generally at the junction of the sole and the wall of the hoof. Care must be exercised in this operation not to pare the sole too much or to cut the frog or the bars of the foot unless absolutely essential. If you are successful you will find a small spot, dark in colour and tending to be softer than the normal tissue, and smelling unpleasantly. On cutting further you should get a discharge of thin, greyish or blackish pus. Once the seat of the trouble is found it is necessary to open up the tissues around the diseased spot to remove all diseased and dead tissue and to provide drainage, and then to clean up the wound as well as possible. Hydrogen peroxide is very useful in such cases, as it brings loose debris and pus to the surface. Finally, disinfect by pouring a little iodine into the wound and plug the hole with a wad of cotton-wool soaked in Stockholm tar, if necessary using a plated shoe to hold in the plug. After-treatment consists of regular dressing until the sole of the foot grows again. Often regular bathing for two or three days in a bucket of water as hot as the animal can stand is of great assistance.

As a precautionary measure, when a nail is accidentally driven too far into the foot at shoeing, withdraw the nail, pour iodine into the hole, or reinsert a hot nail for a moment, and then plug the hole with Stockholm tar. Any foot lameness which occurs within a week or so after shoeing should lead you to suspect that a nail has been driven too close to the soft tissues of the hoof and is causing pressure and pain.

A word of warning about cases where the injury is not easy to find: often in such cases there is a marked swelling and tenderness above and behind the heels, which may mislead you into supposing that the injury is not in the foot itself. But these signs generally mean that the injury is deep-seated in the foot and that pus which cannot escape through the sole of the foot is travelling upwards through the softer tissues. Such cases are usually of a serious nature and are better left for the veterinarian to deal with.

Footrot and Foot Abscess

In cattle and sheep there are two conditions affecting the foot, both of which are very painful, and result in marked lameness, loss of condition, and, in cattle, a drop in milk produced. Probably the same drop in milk production occurs in ewes, which suggests that ewes suffering from footrot will not "do" their lambs so well as healthy ewes. These two conditions are called footrot and foot abscess. Footrot is due to certain definite bacterial organisms which gain entrance to the tissues through abrasions between and behind the claws. It is a highly infectious disease, given favourable conditions, which are a combination of mud to contain the germs and rough metal or other material to cause abrasions in the foot. After a cow first shows lameness several days pass before the condition comes to a head and the abscess breaks. Then it takes another week or two to heal. During the entire period of lameness there is a loss of condition and fall in production. Treatment consists of cleaning the affected foot, applying a suitable mixture, such as bluestone in Stockholm tar, and bandaging to keep clean. Daily bathing in hot water

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helps to bring the condition to a head, and eases the pain.

The most serious aspect of the disease is its infectiousness, as it may run right through the herd. Once it makes its appearance every endeavour must be made to protect the rest of the herd. Affected animals should be completely isolated. If a footbath is available, as is desirable at the yard entrance, fill it with a bluestone solution so that all animals pass through it twice daily. Otherwise it is advisable to clean all possible mud from the yards and race, and to broadcast powdered bluestone over all muddy places around the yards and gateways.

Foot abscess is caused by the ordinary pus-forming organisms which enter by the same channel, but which are not so contagious as those causing footrot. Foot abscess should be treated the same as foot troubles in horses. That is, open up the site of infection, cutting away sufficient hoof to provide drainage, bathe regularly, apply an antiseptic solution, and bandage to keep clean.

Collar and Saddle Galls

Many a good horse is rendered temporarily useless by collar or saddle galls. Such injuries are often a reflection on the teamster or rider, as they are usually caused by ill-fitting or carelessly-applied harness. A collar which fits one horse is unlikely to fit most other horses unless adjusted, and a saddle with wrinkled, badly worn, or hard pads, or with a round-seamed or hard-edged girth is almost bound to cause injury. For effective treatment of these injuries rest is essential. Apart from the cruelty of working such an injured animal, a constantly irritated skin takes longer to heal and is likely to form excessive scar tissue. Keep the affected area clean, clipping the hair on and around it if necessary, and apply regularly a dressing which is antiseptic and astringent. An efficient and often used dressing is known as "white lotion" and can be obtained from a chemist for a few pence.

Udder Injuries

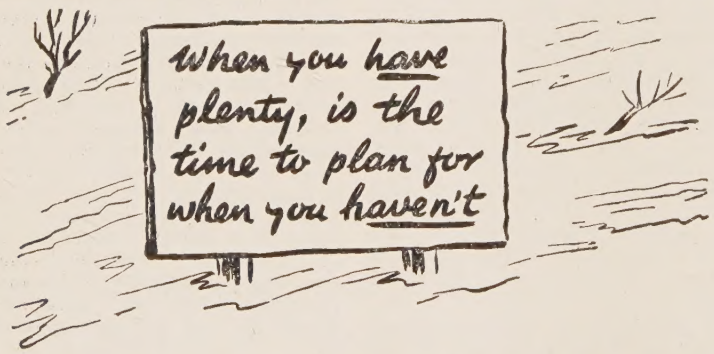
The udder of a cow is the part of the body most liable to injury from barbed wire, sharp horns, stray tins, and sharp stones and sticks. Cows that have the habit of jumping fences are specially liable to injury, and should be controlled by harness of some kind to prevent jumping. Superficial wounds of the udder can be treated in the same way as a simple wound elsewhere, but those which penetrate deeply into the tissues are more difficult to deal with. Where milk oozes through the wound complete healing is unlikely to occur until the cow has been dried off. Similarly with wounds of the teat which penetrate to the teat canal. These cases are serious also because of the danger of entrance of disease germs which cause mastitis. Proper and regular cleaning is all that can be recommended, and drying off the affected quarter as soon as possible. Later the veterinarian should be called in to treat and finally close the opening.

A simple cut on the teat should be cleansed with a weak antiseptic solution, loose shreds of tissue clipped off with clean scissors, and after drying with a clean cloth the surface of the wound may be painted with iodine, or with carbolic acid in glycerine (1 part in 16 parts) obtained from your chemist. Before and after milking the wound should be thoroughly cleaned and a little antiseptic ointment applied. It is, in most cases, a bad practice to stitch the wounds, especially the part from which milk escapes. Sometimes it is necessary to use a teat siphon for a few days on account of the pain caused by pressure when milking. When this is done great care is necessary to avoid later complication with mastitis. The siphon should be boiled before use and placed in a weak antiseptic solution. When it is being inserted into the teat any contact with the lesions on the teat should be avoided. Where the actual opening of the teat canal is affected it is better not to use a siphon, as it is impossible to avoid carrying infection into the teat canal.

Drenching Young Animals

There is one more condition which is worth mentioning at this period of the year, though in no way connected with accidental injuries. Young animals, which should be receiving the best of feeds to maintain a good growth rate, are forced to exist on the relatively poor pastures at present available, with perhaps a certain amount of supplementary foods. This is also the period at which internal parasites are most harmful, and the combination of poor feeding and parasites produces some sorrowful-looking animals in the spring. Calves should be weaned on to the driest and sunniest paddocks available. Recent experiments have shown that it is a good practice to graze the calves in front of the herd. In this way they are continually put on clean pasture, which is certainly not the case when they follow the herd or when they are constantly restricted to the usual calf paddock. In any case it is worthwhile to drench them once a month from weaning with 4-5 oz. (depending on age) of a mixture of 2 oz. of bluestone and one ounce of 40 per cent. nicotine sulphate per gallon of water.

The advice given above should be regarded purely as advice on first aid or for occasions when no help is available. The veterinary surgeon stands in the same relation to your farm animals as your local doctor does to you, and his assistance should be called early for any serious complaint, without waiting until even skilled professional attention is of no avail.



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Nutrition of Breeding Sows

THE nutrition of the sow in New Zealand depends to a large extent on her ability to graze and forage. More use is made of pasture than is the case in most other countries. Pasture alone, however, has two important disadvantages for the sow. It varies both in quantity and quality with the time of the year, and the pig, unlike the cow, has not the ability to deal with large quantities of pasture, even though this may be of high quality.

The sow is in many respects the most efficient producer of our farm stock, and, producing two litters per year, does not have the advantage of a long dry period during which to build up body reserves. Having weaned a litter she is usually mated again within a few days and turned

— By —

C. E. BALLINGER,
Research Officer in Animal Nutrition,
Ruakura.

out into the cow paddocks. From mating until two or three weeks before she is due to farrow again she is expected to maintain herself and build up condition on pasture only. Two or three weeks before farrowing she is given a varying amount of separated milk or meal, depending on the season and the owner's appreciation of a sow's requirements.

Breeding Troubles

Considering the conditions under which many sows are maintained they do remarkably well, but breeding troubles are found to occur from time to time. Some sows are found not to come on heat after weaning, others conceive normally but abort their litters a few weeks before they are due to farrow, while a sow which normally has given good litters will produce a very poor one. There is no need to emphasise the economics of pig production as a part of the dairy farm income or the wartime need for pork and bacon. For a number of years the Ruakura Animal Research Station has been investigating the factors affecting litter production and the nutrition of the sow over the pregnancy period as a means of contributing to more efficient pig production. A part of the work has now been completed and the results of value to the farmer in the interest of greater production are given below.

The aim of the investigation was to examine the effect of nutrition over various parts of the pregnancy and lactation period of the sow. From both practical and theoretical considerations there are two important phases in the sow's pregnancy and lactation periods. The first occurs immediately after weaning. At this stage the reproductive organs are undergoing certain changes which decide whether or not the sow will come on heat. It is generally accepted that any class of breeding stock should be in good condition at conception and that animals in very poor condition are often lower in fertility. The second important phase is the latter part of the pregnancy period when the unborn litter are growing rapidly and making demands on the mother for nutrients to build up their bodies.

Malnutrition's Effects

Poor nutrition at this period could be reflected in three ways. It might be seen in the birth weight of the young pigs, while if the plane of nutrition was very poor, the

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sow's system might find it impossible to maintain the litter in utero, with the result that one or more or all of the developing young die off before birth. Good feeding prior to farrowing should bring the sow into production in a condition allowing her to lactate to her capacity, just as a dairy cow is capable of coming into production at a high level only if she is in good condition and is well fed prior to calving.

From additional research done at Ruakura on sow nutrition and pasture consumption it has been found that a mature sow will graze about 25 lb. of green pasture a day. Both from theoretical consideration and practical demonstration this showed that such sows cannot accommodate sufficient pasture to maintain them in the condition in which they are turned into the paddock to forage for themselves.

From digestibility trials with sows equipped with special digestibility harness in the field it has been found that the organic matter of young grass, containing 14 per cent. of fibre, is about 63 per cent. digestible. Sows grazing in the paddocks in June were found to be obtaining about 25 lb. of green pasture per day. For mature sows heavy in pig this is not sufficient for maintenance, and the unborn litter must therefore be produced from the sow's own body reserves.

Supplementary Feeding

It is obvious, therefore, that while it is economically sound to allow the sow to obtain a good proportion of her food from the paddock, there are important phases of the sow's pregnancy period when pasture should be reinforced by supplementary feeding.

In order to examine these aspects sows were placed on treatments designed to affect the plane of nutrition over the important phases of the pregnancy period. The sows all received a good plane of nutrition until they had weaned their maiden litter, and were then placed as evenly as possible in four groups each of which received the following treatments:

Group 1: Pasture only from weaning until farrowing. The sows in this group were allowed to run in the cow paddocks and their feed supply varied, depending on the season of the year and pasture growth. They remained in the paddock from the day they were weaned from the litter to within a day or two of the next farrowing, when they were brought into farrowing pens.

Group 2: Pasture from weaning until six weeks before farrowing, followed by 5 lb. of meal per day until farrowing. In this instance extra feed was being fed to the sows when they were heavy in pig and the unborn litter growing rapidly. Since the sow is unable to obtain all her requirements from the pasture to maintain herself and litter, she must draw on her own body tissues. Feeding at this period was expected to obviate this condition and bring the sow into lactation in reasonable condition if the feeding was adequate.

Group 3: Fed 5 lb. of meal for six weeks after weaning and again for six weeks before farrowing. Such a ration brings the sow back to good condition immediately after weaning and should she not hold to the first service she is still in a rising condition when she returns to the boar. The feeding over the last six weeks would have the same beneficial effect as given to Group 2. The treatment given to this group was looked upon as being the optimum one in all respects.

Group 4: Fed 5 lb. of meal for six weeks after weaning and followed by pasture only to farrowing. This treatment was given to examine the effect of bringing the sow back to good condition immediately after weaning and to have her in a rising condition during early pregnancy.

Continued for three successive farrowings the four treatments outlined above thus allowed the effect of nutrition over the production period of the sow's life to be examined. Group 1 treatment provided a basis of comparison for the other treatments which covered the critical phases of the sow's pregnancy period.

It should be pointed out that all sows received the same treatment during the suckling period. The feeding then consisted of a basic ration for the sow, plus a production ration which depended on the number of suckers the sow was rearing.

Results of Investigation

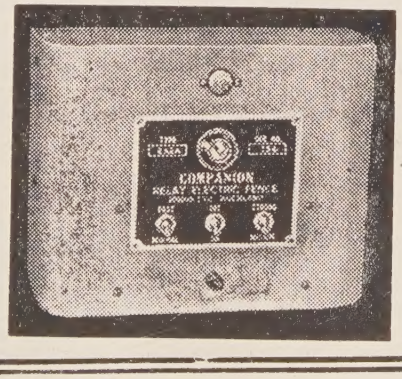
From the practical point of view the value of any method of feeding depends on the sum total of its result and the cash outlay to obtain that result. The farmer carries the number of sows which he estimates will produce the number of pigs he will require to utilise his separated milk. If a proportion of these sows fail to breed or are delayed in breeding, then food is wasted in more ways than one. Firstly, the sow must be maintained whether she is in pig or empty. Secondly, if sufficient young pigs are not available at the right time, separated milk will be wasted or overfed, with the production of overfat carcases.

With these points in mind the results of the investigation are summarised below, the most important figure being the total numbers born and weaned for each group of sows on their respective treatments for the first three farrowings. These were as follows:—

	Born Alive.	Weaned.
Group No. 1	96	78
Group No. 2	94	84
Group No. 3	129	125
Group No. 4	143	130

From the above results it is clear that any improvement in the plane of nutrition over any part of the pregnancy period has given an improvement in production compared with Group 1, which received pasture only.

The improvement in production, however, was not due to an increase per litter for the better-fed groups, but rather to the loss in production by a number of sows in Groups 1 and 2 failing to breed normally. These two groups of sows did not receive any supplementary feed after weaning, and a number failed to come in season at all. This condition persisted over a period of months, although pasture was plentiful. One sow in very poor condition was finally taken from the group and fed for three months, during which time she put on about 130 lb. liveweight. She was then mated and farrowed a litter of 15. This sow was a heavy milker, and at weaning was again in poor condition. She was weaned on to pasture and again did not come in season, but when fed meal again she repeated her previous performance with a litter of 15. It may be added that this sow was then changed over to the group treatment of feeding after weaning and again before farrowing, and did not give further trouble.



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Effect of Change

In order further to test these results the treatments were reversed after the first three farrowings. Group 1 (grass only) was reversed with Group 3 (meal after weaning and before farrowing) and Group 2 (meal before farrowing) was changed with Group 4 (meal after weaning). In each case the first farrowing results were discarded to eliminate any after-effects due to previous treatment.

The results of three farrowings after the change-over are given below, and with them in parentheses the results for the three farrowings prior to the reversed treatments. This allows a complete comparison to be made within and between the groups.

	BORN ALIVE.		WEANED.	
	After reverse.	Before reverse.	After reverse.	Before reverse.
Group No. 1	135	(96)	102	(78)
Group No. 2	95	(94)	68	(84)
Group No. 3	68	(129)	48	(125)
Group No. 4	125	(143)	102	(130)

The change-over in treatment has given the results anticipated with the exception of Group 2, which, while showing no difference in numbers born, has decreased in numbers weaned. This group has therefore not responded to the change to better feeding after weaning. The group did, however, wean considerably more pigs when fed for six weeks before farrowing. This point is discussed later.

The other three groups have shown the effects of the change of treatment to a marked degree. Group 1 increased the numbers weaned from 78 on a low plane to 102 on a high plane. Conversely, Group 3 weaned 125 on a high plane and decreased production to 48 on the low plane, a difference of over 40 per cent. in each instance.

Group 4, which had been fed originally for six weeks after weaning, when changed to being fed for six weeks before farrowing, also showed a drop of over 20 per cent. in production from 130 weaned to 102.

The loss in production after the reversal of the plane of nutrition is considered to be due to the factors which had operated prior to the change. Group 3 sows in particular showed the effect of the change.

On a good plane of nutrition there was no trouble with any sows returning to the boar. On a poor plane, after the first litter, three of the sows did not come on heat. These sows remained on the low plane of nutrition for some months without returning to the boar, but returned to regular breeding after fed supplementary feed for about six weeks.

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Effect on Birth Weight of Litter

Feeding affects the performance of the sow not only in her regular production of a litter but also in the weight of the litter at birth and in her milking ability. During the period of investigation the litters from the sows were weighed at birth and at weekly intervals up to weaning at eight weeks. Prior to the reversal in the treatments the birth weight of the litter and the live weights up to three weeks showed that Groups 2 and 3, which received supplementary feed for six weeks before farrowing, produced the heavier pigs at birth and that these differences remained up to weaning. Group 3 produced slightly heavier pigs than Group 2, which was to be expected, since Group 2 was fed only for the last six weeks before farrowing.

The total mean weights at birth and the increase in live weight from birth to three weeks and from birth to eight weeks show the advantages of better feeding.

	ORIGINAL TREATMENTS.			
	Group 1.	Group 2.	Group 3.	Group 4.
	lb.	lb.	lb.	lb.
Mean weight birth	2.24	2.71	2.84	2.39
Mean increase birth—3 weeks	6.94	9.43	10.09	7.41
Mean increase birth—8 weeks	36.11	38.59	40.38	33.09

The reversal of the feeding treatments gave similar results:—

	REVERSED TREATMENTS.			
	Group 1.	Group 2.	Group 3.	Group 4.
	lb.	lb.	lb.	lb.
Mean weight birth	2.40	2.63	2.22	2.69
Mean increase birth—3 weeks	9.16	8.43	8.56	8.65
Mean increase birth—8 weeks	35.16	34.86	34.17	32.80

Comparing the reversed treatment with the original one, it will be seen that Groups 1 and 4 have improved their litter production at birth and up to three weeks, although the differences tended to fade out at eight weeks. After three weeks of age creep feeding the litters tends to iron out the early differences.

Pasture Alone Insufficient

In support of these results further work with other sows has substantiated the inadequacy of pasture as a sole diet for a breeding sow. The same factors were found to operate. Sows in low condition failed to come in season, while others have carried their litters to within about two weeks of due date and have then aborted. In each such instance the sow was in low condition and had presumably reached a stage where she was unable to continue the nourishment of her litter.

Whether it is profitable or not to improve the nutrition of the sow depends on the increased cost. To feed a sow on purchased meals for six weeks after weaning and again before farrowing would cost about £2 13s. per sow at present prices, without allowing for the cost of feeding while suckling the litter. It will be noted that over the six farrowings sows fed in this way weaned 101 more pigs than sows fed on grass alone. The total meal fed cost £15 18s., so that each additional pig cost 3s. in purchased meals.

Not Great Outlay

In practice, however, the necessity for complete dependence on purchased meals should not arise. Much of the ration can be supplied as separated milk or buttermilk. For the winter litter the feed required should be largely supplied as roots and farm-grown crops. At the most 1½ lb. of meat meal per day should be all that need be purchased, costing about 16s. per litter. This does not entail any great cash outlay and assures the production of a healthy litter from every sow and retains the sow in excellent condition throughout her life.

Summing up the position, it can be claimed that the results of careful experimental observations of the type outlined above clearly demonstrate the value of a good plane of nutrition for the breeding sow. Irregular breeding is reduced, loss in production through irregular out-of-season farrowings is avoided, and more pigs are weaned from a given number of sows. Well-fed sows further produce heavier pigs at birth and through their superior physical condition are better able to suckle their litters. It is equally clear that the common practice of maintaining sows on pasture alone during the pregnant period is inefficient, due to the inadequate nature of pasture as a pig food.

STUDIES IN FARM MANAGEMENT

The production of pasture and crop seeds is an expanding industry in South Canterbury, and the following description of a Waimate farm indicates how this industry is being developed and incorporated in mixed farming practice.

— By —

J. D. WRAIGHT,
Fields Instructor, Timaru.

THE district of South Canterbury, embracing the Geraldine, Levels, Mackenzie and Waimate Counties, extends from the Rangitata River in the north to the Waitaki River in the south, and from west to east the topography changes from steep, tussock-covered mountain ranges to rolling hills covered in loess soils, with finally alluvial flats on the sea coast (Fig. 2). With the exception of the tussock county the land is devoted to arable mixed farming, and the main arable area of South Canterbury consists of rolling hills of loess soil. "The main soil type (type 2, Fig. 2) is a moderately leached silt loam formed on an ancient deposit of wind-blown silt derived from the inland glaciated region at the end of the last ice age. The top soil is a moderately fertile silt loam, passing into a heavier subsoil, which ranges in texture from a heavy silt loam to a silty clay loam according to the drainage. Soil variations on the downlands of South Canterbury, where the parent material of the soils is loess, are determined by topography and climate. Where the surface is flattish drainage is poor and rushes tend to appear on the surface, the subsoil is heavier, and there are commonly many pebbly iron concretions in it. On the better drained rolling downs concretions are absent, and only rusty mottling shows that any iron has been carried down into the subsoil." (1).

Fig. 1.

These clay downs rise from about 100ft. above sea level near the coast to 1,000ft. above sea level at their highest point towards the foothills, but in general have an elevation of from 300 to 400ft. above sea level. The average rainfall for the past eight years recorded at Timaru is 24.41in. per annum, with an irregular monthly distribution as shown in the accompanying table taken from records at Waimate for the past two years:—

	1942.	1943.	1944.
January	1.58	2.67	1.73
February	3.10	2.23	6.53
March	1.46	2.54	1.98
April	.67	1.59	4.00
May	4.33	.20	—
June	.24	3.30	—
July	1.00	.62	—
August	.39	1.84	—
September	1.04	6.11	—
October	4.99	3.32	—
November	1.48	2.33	—
December	3.85	1.70	—
Total	23.75	28.12	

It may be fairly stated of South Canterbury that the rainfall distribution tends towards a dry summer and medium to dry winter, with the main precipitation in the autumn and spring months.

(1) Description of soils and soil map by J. D. Raeside, Soil Survey Division, Scientific and Industrial Research Department.

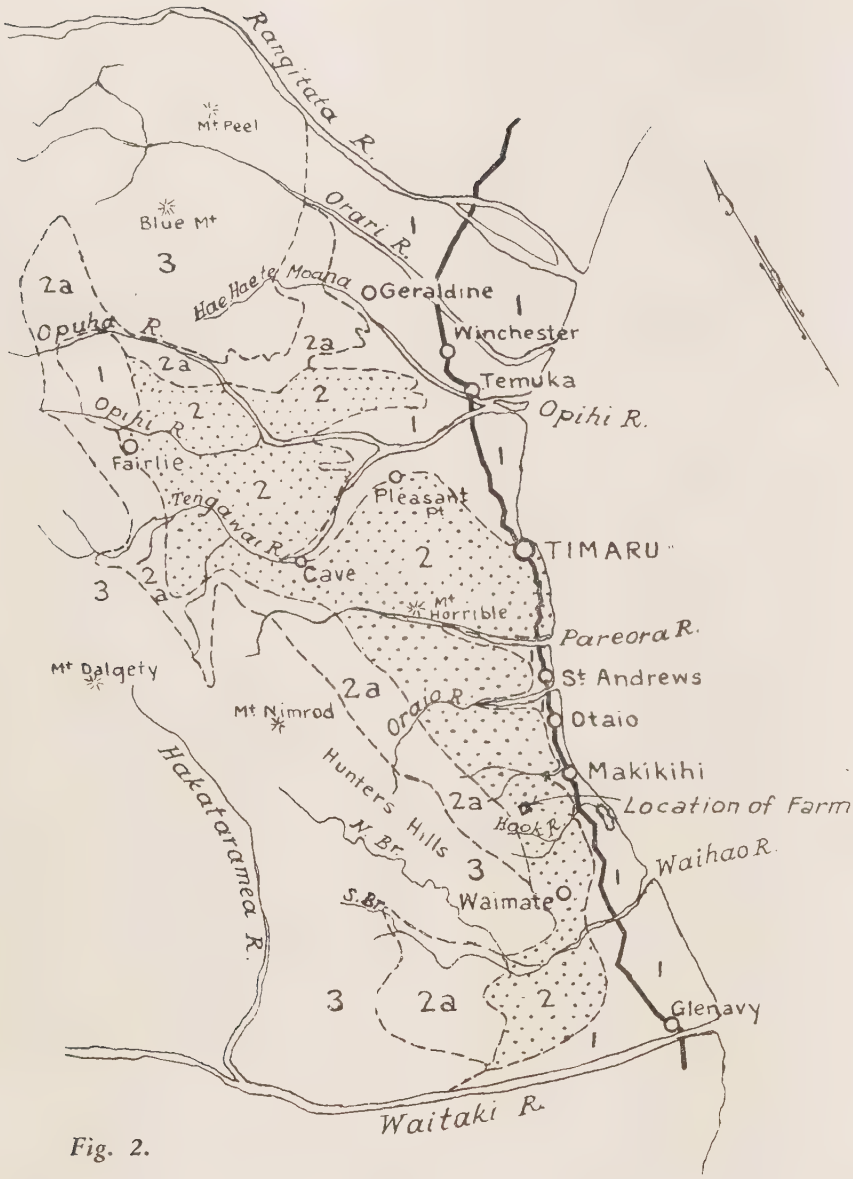


Fig. 2.

Some idea of the size of a mixed farm holding can be gained from the following table:—

	No. of Holdings.	1941-42 Area Occupied. Acres.	Average area of Holdings. Acres.
Geraldine County	966	391,733	406
Levels ,,	838	158,994	190
Mackenzie ,,	415	1,501,711	3,619*
Waimate ,,	1,248	776,374	622†

* The greater part of this county is tussock country.

† Portion of this county is tussock country, and the size of the average mixed farm is considerably smaller than indicated by the table.

From the above table it is seen that the average size of holdings in the mixed farming counties of South Canterbury is not large. The total area occupied by all such farms is approximately 750,000 acres. Of that area some 584,883 acres are in grasses, clovers, and lucerne, maintaining 1½ million sheep with an annual production of approximately 1 million lambs, plus dairy and other primary produce. Winter and supplementary feed was responsible in the 1941-42 season for 76,902 acres of fodder crops being harvested in South Canterbury. Some 24,495 acres of grass and clover seeds were produced in the 1941-42 season, and the following table gives some idea of the trend towards increase in acreage of grass and clover seeds produced in recent years—

	Per. Rye.	Italian Rye.	Cocksfoot.
1938-39	3,942	941	647
1939-40	4,666	1,087	562
1940-41	8,598	3,225	829
1941-42	10,736	2,591	959

	Crested Dogstail.	Red. Clover.	White Clover.
1938-39	1,190	1,988	856
1939-40	67	2,107	362
1940-41	195	3,660	1,581
1941-42	336	6,975	2,898

A WAIMATE MIXED FARM.

The following is a description of a medium-sized mixed farm in the Hook district of South Canterbury. Although it may not agree in every detail with the "average" farm on similar land, it will give a general idea of the usual farm operations practised in maintaining a flock, growing wheat and other crops, together with the saving of areas of ryegrass, white clover and red clover seeds. As was stated in the introduction small seeds do not play the major part in this farm programme; rather they are supplementary to a sound programme of wool and fat lamb raising and the growing of necessary war commodities such as wheat and linen flax. In peace-time the programme would be changed somewhat in that less wheat would be grown and more attention would be paid to the flock, fat lambs, top-dressing, and the possible expansion of the area harvested for seeds.

The farm is 329 acres of clay-bottomed "downs" country to the north of Waimate, which lends itself to

cultivation by means of a wheel tractor. The topography of the farm is easy undulating for the most part with a few flattish paddocks where the surface drainage is poor. The farm is maintained by the owner with the assistance of one man for one month in the spring, and again at harvest time the assistance of one man is required. Casual labour is necessary when crops of linen flax are grown, otherwise all harvesting operations are done mechanically.

Sheep Programme

A flock of 480, two, four, six, and eight-tooth Romney cross ewes is carried and is maintained by the purchase each year of 100 two-tooth ewes with the consequent culling of 100 broken-mouthed ewes which are fattened on pasture and second-growth rape. Southdown rams are used for fat-lamb production, and it is interesting to note that the owner breeds his own rams from a small flock of about 30 Southdown ewes. The ewes are "flushed" on newly-sown grass and the rams put out in the third week in March, which gives early lambing at the end of August, in order to give the lambs every chance to make good growth on the new grass paddocks prior to shutting them up for seed in late October. The lambing percentages range from 100 to 110 per cent. and the first draft of fat lambs is usually taken about December 20 and eventually 50 per cent. of the lambs go away fat "off the mothers." The wool clip is at the satisfactory yield of 9lb. per head.

Supplementary Feeding

Each year approximately 20 acres of chou moellier and swedes are grown for winter feed for the ewe flock, and this is sown on 28in. ridges on a paddock broken out of lea and intercultivated, which makes for cleaner paddocks for subsequent crops. The winter feed is sown on three breaks as follows:—

1. A break of approximately one third of the area of pure swedes at the rate of 14 to 16oz. seed per acre with reverted superphosphate at 2cwt. per acre.
2. A break of equal area of a mixture of swedes and chou moellier sown with approximately 8oz. swede seed and 12oz. chou moellier seed per acre.
3. A break of straight chou moellier for early spring feed; seed at the rate of 1lb. per acre in ridges.

As this amount of feed is usually in excess of the requirements of the flock for 10 to 12 weeks' feeding, a portion of it is sold to hill country graziers at a stated price per head per week.

In addition to the above 16 to 20 acres of rape is sown, usually following turnips and chou moellier, and it is not necessary to plough the land, as all the cultivation is done with the hustler and grub harrows. The rape is drilled in 7in. rows. This amount of rape ensures the fattening of the balance of the lambs and frequently in good fattening seasons allows a portion of it to be sold to outside graziers.

Cereal Crops

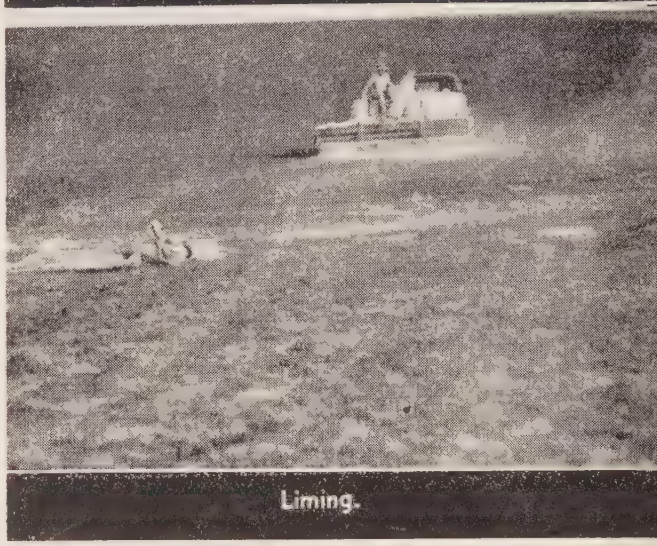
This year 40 acres of Cross 7 wheat will be grown, 20 acres of which will be sown on rape land and 20 acres on pea stubble land in May. Last season 38 acres of wheat were grown, 8 acres barley of malting quality, and 20 acres Prussian blue peas. Wheat growing on this farm has averaged 45 bushels per acre since the owner took it over in 1940. No cereals are grown for supplementary feed, as the need of such crops is overcome by the sowing down of permanent pastures in January and February.

Grass and Clover Seeds

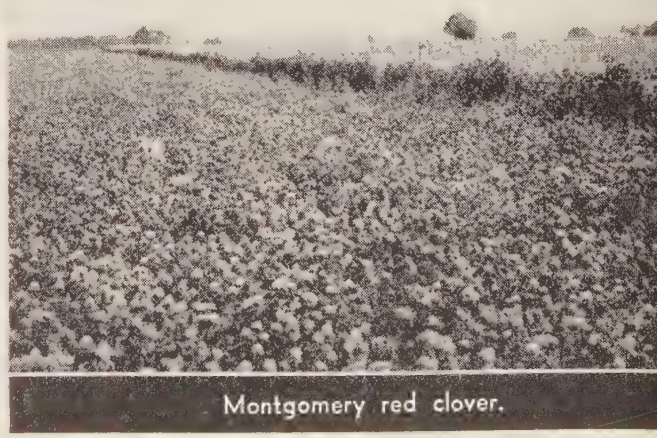
Two new areas of perennial ryegrass were sown this autumn, 10 acres in February, and 20 acres in May (on account of the bad season). The mixture used for this is 30lb. perennial ryegrass, 3lb. white clover, and 1lb. dogstail, and these areas will provide early feed for lambs until they are closed for seed in the second or third week in October. These areas will be mown in early January and the swathe picked up by the owner's all-crop harvester. First-harvest areas such as these usually yield very well, 25 to 30 bushels per acre having been harvested. Both these areas will be available for sheep grazing again in January.

VIEWS OF THE FARM

Cross 7 wheat.



Liming.



Montgomery red clover.

Two areas each of 8 acres will be closed up for white clover seed production at the end of October and the same procedure in harvesting will be followed as with the ryegrass and the areas will be clear for further sheep grazing at the end of January. Both these areas have been harvested this past season for ryegrass seed. It is anticipated that three areas of 13 acres, 7 acres, and 5 acres of Montgomery red clover will be harvested for seed this year and the procedure will be to graze these areas until the first week in December and then allow them to go to seed. A further 23 acres of Montgomery red clover which was sown into last year's wheat crop in the spring may be closed up for seed if it proves to be a good enough stand, as last spring conditions were unfavourable for the establishment of clover under wheat.

In addition to the above a further 20 acres of third-harvest white clover may be closed for seed if the feed position in October warrants such action.

It is the practice of the owner of this property to sow all certified seed of pedigree strain to ensure the highest possible returns from the seed which he harvests.

1. 10 ac. New grass sown end February on fallow following stubble perennial ryegrass and white clover mixture. Will be closed for ryegrass seed next October.
2. 16 ,, Montgomery red clover, sown spring, 1941. Closed up for seed at present.
3. 20 ,, In pea stubble—for rape next Nov.
4. 20 ,, Rape stubble—for autumn or winter sown wheat.
5. 15 ,, 8 acres perennial ryegrass and white clover sown March, 1943. 7 acres Montgomery red clover sown November, 1942. Both areas will be closed for seed next spring.
6. 25 ,, Perennial ryegrass and white clover sown January, 1942, and harvested last season for grass seed and white clover.
7. 12 ,, Old pasture—to be sown in linen flax in October next.
8. 10 ,, Tussocky face—rough grazing.
9. 16 ,, Permanent pasture sown autumn, 1943 —will not be harvested.
10. 11 ,, Montgomery red clover and ryegrass sown February, 1942, now under grazing.
11. 20 ,, Wheat stubble for swedes and chou moellier in November.
12. 23 ,, Fallowed out of linen flax for wheat.
13. 25 ,, Chou moellier and swedes for winter feed.
14. 13 ,, Montgomery red clover sown on wheat, spring, 1942. At present closed for clover seed.
15. 23 ,, Wheat stubble—sown out last spring with Montgomery red clover and ryegrass—for seed next spring.
16. 20 ,, New grass, sown May, 1944 with perennial ryegrass and white clover. For ryegrass seed next harvest.
17. 5 ,, Montgomery red clover, sown autumn, 1942. Now closed for seed.
18. 8 ,, Barley stubble. Sown out in spring, 1943, with white clover and ryegrass. For white clover seed next harvest.
19. 2 ,, Lucerne. Sown 1941.
20. 2 ,, Pasture. Cow paddock.
21. 3 ,, Ploughed for potatoes.

Sowing Down Pastures

On account of war conditions necessitating a larger area of wheat, the sowing down programme has been interfered with in that it has been necessary to sow perennial ryegrass and white clover in January-February on a fallow following a cereal crop, whereas the original plan was to sow down in February on a short fallow following a fed-off crop of roots. Similarly the sowing of Montgomery red clover has had to be accomplished by sowing it into the wheat crop in the spring.

It may be said of the above that crop rotation has not been studied to any degree, but it has been pointed out that war conditions have meant certain amendments to the most desired rotation. As it stands at present the rotation is as follows: Lea land, swedes and chou moellier; rape; wheat; fallow and sow out to grass; seeds production for three seasons; grazing two seasons and plough up.

As each pasture is sown down one to one-and-a-half tons of carbonate of lime are applied and no further applications are made during the lifetime of the pasture, which is only approximately five years. To date 165 tons of lime have been sown since 1940-41 season, giving an average application of 55 tons of lime per annum. When superphosphate was available without restriction all new areas of grass and clover received 2cwt. per acre each autumn in top-dressing and 5 to 6 tons of super were used annually.

A small area of 2 acres of lucerne was established in 1941 and is producing very well, demonstrating the value of lucerne on this type of soil. Sufficient hay is produced from this area for milking cows and also to give lambs on rape sufficient to vary their diet.

The growing of small seeds such as ryegrass, white clover, and red clover works in admirably on this type of farm for the following reasons:—

1. The flock of about 500 sheep is sufficient to control the grazing of areas closed up for seed.
2. The paddocks are small enough to allow concentrated grazing, thus simplifying control of growth.
3. Sufficient winter feed and supplementary crop is grown to enrich the land by dunging, thus securing good conditions for sowing down or for cereal crops.
4. Mechanisation of harvesting operations ensures crops being saved with minimum labour and risk of loss.

WEED SEEDLINGS

CONTROL BY WEED-BURNER

THE control of weeds is an ever-recurring necessity with farmers, market gardeners, nurserymen, and anyone else who is concerned with the growing of plants. This article discusses a relatively new aspect of weed control by the use of fire, that is, the destruction of weeds in the seedling stage, with the weed-burner as the fire-producing agent.

— By —
S. H. SAXBY,
Instructor in Agriculture,
Dunedin.

Just as there are many types of weed and many types of work involved in the growing of plants, so are there many types of weed control in common usage. The plough, the cultivator, and the bulldozer represent some of the means of mechanical control that are used for plants from the seedling to the fully-grown, mature plant.

Chemicals such as sodium chlorate, sulphate of ammonia, and even common salt are used to control weeds in pastures and playing fields. Stock also frequently act as controllers of weeds, goats for blackberry, cattle for bidi-bidi, and so on.

For many years fire has been a very useful agent in weed control. In the early days both tussock and bush which were regarded as weeds in the widest sense fell before Vulcan, the god of fire. Broom, gorse, and other weeds are regularly burnt, the fire being kindled by match, torch, and flame-thrower.

First Experiments

The subject of fire control of weed seedlings was introduced in this Journal in November, 1942, by Mr. C. R. Taylor, who described the use of a weed-burner for destroying weed seedlings in seed-beds at a Services' Vegetable Production Unit at Rotorua. Following a consideration of this article several experiments were carried out at a similar unit at Outram, in Otago. The object of these experiments was to decide whether or not the suggestions made in the article referred to could be used successfully for weed seedling control on a large scale. As the result of these experiments and the following season's practical experience a considerable amount of useful information has been obtained, from which it is possible to forecast a number of uses to which the use of the weed-burner can be extended.

The basic principle of this use of the weed-burner is the rapid destruction of young seedling plants while they are small and tender. This use is very different from the use to which most weed-burners and flame-throwers are put, namely the kindling and maintenance of a fierce fire in a plant of considerable size. This article is in no way concerned with this latter aspect of weed destruction by fire.

Ideal Flame

For the destruction of young seedling weeds a fierce "oil-less" flame is required. A flame similar in type to but much larger than the painter's blowlamp is ideal. A raw, oily flame should be avoided. Such a flame is likely to do more harm than good, as it may leave a film of oil on the surface of the ground which is liable to damage the sown seedlings as they come through.

With an "oil-less" flame and holding the head of the burner an inch or two from ground level a complete kill of weeds growing up to half an inch or so in height and in a 6-in.-wide strip may be secured. The speed at which the operator may travel varies, of course, according to existing conditions, but is usually in the vicinity of one and a half miles per hour or two chains per minute, which is a comfortably slow walk. Provided they are very young and tender most weeds will succumb to this fierce flame. Seedlings of many plants, including the following, are killed very readily: Spurrey, fat hen, chickweed, redshank, pimpernel, wild turnip, and wireweed. Mature weeds such as the various twitches, sorrel, and docks are not permanently affected, as they have a good underground store of vitality that enables them to recover from what is in effect a surface pruning.

On a great deal of country a large number of weed seeds germinate and appear as seedlings some days before the seed that is sown shows up. This is particularly noticeable in the spring when seedlings of spurrey and fat hen frequently provide a green mantle to a paddock before the crop that is sown comes through the ground. This is, of course, due to the fact that the

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weed seeds in the ground are usually, and particularly in the spring, sufficiently moist to enable them to germinate rapidly as soon as they are brought near the surface of the soil. The seed that is sown has to take up moisture before it germinates and is, therefore, several days behind the weed seeds in appearing above the soil.

Time to Burn

It is at this stage that the weed-burner is used, namely, after the weed seeds have appeared and before the sown seed shows. Within reason the longer the interval between the final preparation of the ground and the sowing of the seed the more efficient will be the burning; the longer the interval the more complete is the germination of the weed seed lying near the surface of the soil.

Using the weed-burner as described above will kill the weeds and leave the ground free of growing plants until the seed that is sown comes up. The whole principle is very simple, but is extremely effective.

In practice this burning has the same effect as that of top hoeing. Top hoeing is a fairly delicate operation involving the running of a light hoe immediately under the surface of the soil before the seedlings of the sown plants appear. This action cuts or moves the seedling sufficiently to ensure its death. Top hoeing is very effective, but can be carried out only on an even and dry seed-bed. The weed-burner is effective on both a fine, dry seed-bed and a rough and wet seed-bed that is not suitable for the use of the hoe. In addition to this the ground can be covered much more rapidly with the weed-burner than is the case with top hoeing. In windy weather the weed-burner is not as efficient as it is on a calm day. It should be emphasised that the weed-burner does not affect ungerminated seed, as it travels too rapidly for this to be done. Nor does the heat penetrate the soil sufficiently deeply to kill all weed seedlings that have germinated but that have not appeared through the soil.

That the penetration of the heat from the burner through the soil is extremely small can be seen by the following small trial. Place a sheet of dry newspaper on the ground and completely cover it as thinly as possible with fine, dry soil. Then move the burner over it at the speed recommended (viz.: 1½ m.p.h.). It will be seen that the paper is not even scorched. In order to scorch the paper the burner has to be held steady for seve-

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ral seconds. This demonstrates that the flame does not penetrate sufficiently deep to kill any seeds, and that the young seedlings just below the surface of the soil are unaffected whether they are weeds or "sown." Any delay in the burning until the sown crop appears would lead to its almost complete destruction. Consequently it is absolutely essential that a very close watch be kept on the germination of the sown seed and the progress of the young seedling. It would be unwise to suggest that the burning should be carried out a stipulated number of days after the seed is sown. So much depends on the kind of seed sown, and its vitality or rapidity of germination. Even more important is the condition of the soil and the existing climatic conditions. In very dry weather burning may be delayed for a week or 10 days or even longer, whereas in warm, moist weather which favours germination four days may be too late. Experience and an eye on the seeds is the only safe guide.

The whole of this patch was sown out with lawn grass seed. The left-hand portion was burnt, excellent weed seedling control resulting.

At the unit at Outram several acres of crop were successfully "burnt" last spring in the manner described. Crops treated in this way include the following:—Onions, leeks, cabbage, silver beet, carrot, parsnip, soft turnip, and lettuce. In every case good weed control was secured.

All of these crops were sown in rows, usually 20 in. apart. This left a strip of ground between the rows of some 14 in. which was not burnt. The "burnt" sections remained virtually weed free long after the spaces between the rows had had to be hoed several times. A point worth noting as far as the burning is concerned is that subsequent cultivation should not be too close to the "burnt" rows. If the cultivation is close, soil is almost certain to be thrown on or close to the rows. This disturbed soil is almost certain to contain seeds ready to germinate wherever they are placed. If they are placed close to the row they will germinate there and nullify, to some extent at least, the effect of the burning.

The centre strip, which is a mass of weed seedlings, was not burnt. On either side of the strip the burner was used, with the result that the weed seedlings were almost completely destroyed.

Between Established Plants. In one other direction a small experiment has shown that the weed-burner may be very useful. The ground is frequently too wet to hoe, yet the weather is ideal for weeds to grow, with the result that the weeds between the rows become so large that their eradication by the hoe is slow, costly, and sometimes not very effective. The trial referred to consisted of the burning of weed seedlings in between the rows of established plants. A good control was secured, but complete control, particularly very close to the plants, was not possible on account of the damage liable to be done by the spreading flame. In order to overcome this a two-wheeled carrier for the burner was constructed. While the design of this carrier is subject to considerable improvement the principle involved is the provision of a shield that will travel at ground level between the flame and the plant. Trials showed that this principle is quite satisfactory. The carrier also has the advantage of making the work of the operator easier. The continued and steady holding of the burner places a fairly severe strain on the operator. In addition to this without the carrier

Burning too late will kill the sown seedlings. Here the centre row of silver beet was practically destroyed as the result of burning when the seedlings were just appearing.

the heat generated by the burner causes the operator's foot to become very hot as it passes backwards and forwards beside the burner.

Ragwort Control

Another use to which the weed-burner may be placed, although not strictly similar to that just described, is the destruction of the mature ragwort plant. The destruction of any plant or pest should be aimed at its weakest point. With established plants this weakest point is usually during its flowering period when their whole vitality is concentrated in the all-essential seed setting.

Some years ago when the control of ragwort was being investigated at Ruakura it was decided to investigate the possibilities of control by fire. The trial consisted of severely scorching a number of plants with a weed-burner. The result was that 93 per cent. of the plants so treated died completely, the remaining 7 per cent. recovering. In addition to this no seed was set by the plants which had been scorched. The mortality rate secured in this trial was higher than any other yet secured in trials concerning the treatment of mature plants. From the evidence secured it appears that the method offers considerable possibilities for farmers who have to deal with small infestations of ragwort.

Other Possibilities

The weed-burner has proved itself to be an efficient and useful apparatus for the control of weed seedlings on a large scale in vegetable production. The question arises, to what other uses can it be put on similar lines? The following came to mind at once and could doubtless be added to very considerably.

1. **The nurseryman could use it for beds planted out with bulbs and similar plants. He could use it for his seed-beds. Where seed is to be sown in trays it should be just as emcient.**
2. **The people concerned in the raising of tree seeds could use it on the rows with good effect.**
3. **A small-scale trial has shown that it is quite satisfactory in killing seedling weeds in a recently-sown lawn. Although much lawn grass seed remains on the top of the ground the control of the weeds was satisfactory and the burner did not harm the lawn seed.**

The centre strip was burnt before the parsnip seedlings had emerged. Practically no weed seedlings have survived to choke the parsnip seedlings.

4. **Experience has shown that seedling grasses and clovers are very susceptible to the flame. The burner could, therefore, be used by research institutions that are desirous of excluding volunteer plants from sown plots.**
5. **There is little doubt that the weed-burner could be used effectively by farmers for certain crops, particularly those that are slow to germinate, such as mangolds and sugar beet. For quick-establishing and rapid-growing crops it is unlikely to be a successful proposition, but for slow-establishing crops such as those mentioned the burner has distinct possibilities. On country that is badly infested with yellow weed (wild turnip and charlock) its use may be effective with a turnip crop.**

For the home gardener the expense of a weed-burner would certainly not pay unless it could be used for other purposes as well.

TERRIFIC WHITE HEAT 2000° FAHRENHEIT

SPELLS DOOM FOR NOXIOUS WEEDS!

Use the BEST BURNER—science's newest discovery—for Nassella Tussock, Blackberry, Gorse, Rushes; sterilises poultry houses, floors, yards; burns off drain sides, water races, gravel paths.

IT IS *NOT* A FLAMETHROWER

Weighs only 28lbs. fully charged; requires no pressure pumping; burns only ½-gallon of diesoline an hour—cost approximately 6d.

SAVE TIME — LABOUR — MONEY — with a BEST BURNER

Send for Free Pamphlet to the Manufacturers:

The
BEST BURNER LTD.
Cnr. Oxford Terrace and Montreal Street
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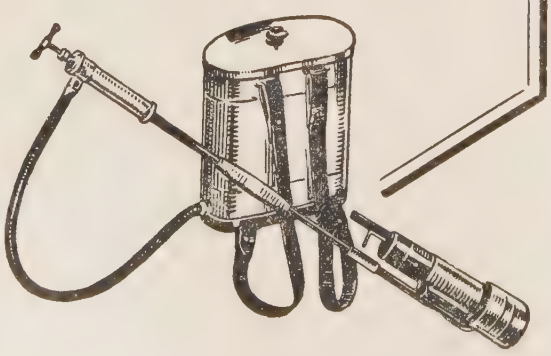


Ammonium Nitrate Fire Hazard

AMMONIUM nitrate is an explosive if improperly handled, but the explosive danger is eliminated if the nitrate is handled like any other fertiliser.

It is therefore recommended that **paper fertiliser bags should be burnt when empty, as they create a fire hazard, and burlap or cloth bags should be thoroughly washed before storing.**

Coccidiosis of Poultry

COCCIDIOSIS is one of the most destructive diseases of poultry, and is probably the most prevalent infectious disease attacking poultry in New Zealand. This disease has been reported from many districts in both islands, and the annual loss among infected birds is heavy. It is, therefore, of considerable importance that poultrykeepers should be able to recognise an outbreak of coccidiosis and to know what steps to take to bring such an outbreak under control.

How to Recognise Coccidiosis

There are two main forms of coccidiosis among poultry. These forms may be distinguished by poultrykeepers according to the age of the birds attacked. The first, or more acute, form attacks young chickens between the ages of approximately two to eight weeks. This is referred to as caecal coccidiosis, as the internal parasites causing this disease attack mainly the two caeca or blind guts. Often the first sign of trouble is the presence of one or more dead chickens in a pen, and later the remainder become loose in feather, tend to huddle together, droop their wings, and close their eyes. A careful examination of the pen will reveal droppings containing blood. If a dead chicken is opened the caeca will be found inflamed and distended with blood.

In outbreaks where the disease is less acute birds may not die so rapidly, and merely show ruffled feathers and general unthriftiness. On opening such birds it is often difficult to detect blood in the caeca, although they are usually enlarged. In these circumstances dead birds should be forwarded to the laboratory (see address at end of article) for examination, and a definite diagnosis of the trouble obtained.

The second form of coccidiosis is encountered in older birds, and is not so easy to recognise. This form usually attacks well-grown pullets before coming into lay or when they have been in lay for a few weeks. Birds so attacked show signs of looseness of feather, a false moult, or a drying-up of the comb. These symptoms may be accompanied by lameness in one leg and a loss of eye colour. If such birds are left in the pen they lose condition and gradually "go light." While mortality is not necessarily heavy, birds affected in this way rarely recover, and are a big source of danger to healthy stock.

This form of the disease is referred to as duodenal coccidiosis, as the parasites attack the lining of the small intestine or duodenum. Unfortunately, it is not always easy to recognise this disease by an inspection of the small intestine with the naked eye. It is therefore essential to send typically unhealthy birds to the laboratory for a microscopic examination whenever this disease is suspected. Of the forms described the second is the most dangerous and should be brought under control as soon as possible. Duodenal coccidiosis may mean the loss of many valuable pullets, resulting in a serious loss in egg production.

The digestive system of a fowl. No. 1 is the small intestine, and No. 3 the caeca.

Cause of Disease

While it is not essential that a poultrykeeper should know the complete life history of the internal parasite causing coccidiosis, some knowledge is an aid to understanding why certain sanitation methods are so important in the control of an outbreak of this disease. Such knowledge also makes it easier to understand why the possibilities of successful medicinal treatment are so limited.

Coccidiosis is caused by an organism which is invisible to the naked eye. Coccidia are not confined to domestic fowls, but also occur in wild birds and most animals. Fortunately those species found in animals and birds do not infect poultry, but wild birds will occasionally spread the disease by carrying coccidia organisms on their feet. This may account for some of the sudden outbreaks observed from time to time on new farms and on farms where the disease has not previously been observed.

Coccidia pass through a complicated life history, but two main phases of this life cycle are of interest to poultrykeepers. The first stage is when the organisms are living and multiplying in the bodies of infected birds and thus setting up the disease, while the second stage must be completed outside the birds in litter or in the soil over which birds are running. This second stage occurs after the organisms have passed out of infected birds in their droppings. Healthy birds may now pick up these coccidia-infested droppings when feeding, but these organisms must undergo a change, which takes from two to four days, while outside a bird's body before they can infect a healthy

This space was reserved for

F. COOPER LTD.

but owing to the fact that they are busily engaged in the more important task of increasing production of their high quality Vegetable and Farm Seeds they have not time to write an elaborate advertisement; but they wish you to be assured that they are, as usual, concentrating on the reselection and improvement of their various stocks and strains of which there will be sufficient seed available for normal requirements.

FARMERS !

–now, as never before, the call is

Humanity

The invasion is on. We hold the initiative. Men, morale, equipment, are abundant . . . we'll WIN, if there's FOOD! Food for the Armies of Liberation, food for the supply fronts, food to sustain the people of France, then Belgium and Holland . . . to succour the tottering men and women of gallant Greece and Yugoslavia . . . the brave mothers, the undernourished children of Prague, Warsaw, Oslo. FOOD NOW, not six months or a year after the German hordes have sounded the retreat . . . food in bigger, bigger and even BIGGER quantities. Humanity calls urgently for it; calls YOU for sustenance, from that greater Second Front which is your farm.

YOU WILL NOT FAIL. The courage and determination of New Zealand has its roots in the soil. More long hours of back-breaking labour . . . shortage of help . . . fertiliser . . . over-worked machinery . . . these are still your lot. No bands will play, no banners will fly, except in your own heart. Yet you'll answer this call. The food you'll produce is the manna of freedom . . . the yields from your farm, the hope of the world.

The Allis-Chalmers Tractor Organisation salutes these hands that will know more toil, longer hours than any except the soldier on the fighting fronts. To assist in the quick maintenance of hard-worked Tractor equipment is an honour and privilege. The Service Shops of DOMINION MOTORS LTD. and their Dealers are ready, willing and able, to help farmers gain quicker returns by more efficient power traction for every man hour of operation.

THE DOMINION MOTORS LTD., North Island Distributors for:—

ALLIS-CHALMERS

bird. This is of considerable importance, as will be seen later.

A further important fact is that during the second stage spent in the soil the organisms are well protected against cold, draught, and heat, and may, under favourable conditions, remain alive for as long as a year. It is also important for the poultrykeeper to realise that while the organisms are living and multiplying within an infected bird they are embedded in and destroying the delicate lining of the caeca or small intestine.

Treatment and Control

No entirely satisfactory medicinal treatment for either caecal or duodenal coccidiosis has yet been found. Medicines which are strong enough in chemical action to destroy the coccidia will also destroy the delicate lining of the intestine itself. On the other hand, it is thought that if an acid condition is set up in the intestines of infected birds the multiplication of the coccidia is checked, while a mild scouring of the bird is set up which causes a large number of the organisms to be carried out in the droppings. It has been seen that these organisms are not able to infect healthy birds for two to four days after leaving the infected birds, so that if the coccidia are removed by the careful cleaning of the house they can be burnt before again becoming dangerous. It has been found that this method of attempting to overcome an outbreak is more effective against caecal than duodenal coccidiosis.

While it is not intended to suggest that treatment for caecal coccidiosis in this manner is always effective, the following method has been found useful on a number of occasions under practical conditions. **Success depends to a great extent upon noting an outbreak at an early stage and acting immediately.**

Confine the young chickens to their brooder house pen and remove all food for 12 hours. Next, supply a liberal amount in ample hopper space of a chicken mash containing 40 per cent. dried milk powder. Leave this special mash before the birds for 24 hours and then remove. Now feed in the ordinary manner for 24 hours, and clean out the pen thoroughly at the end of this time. Starve again for 12 hours, give the 40 per cent. milk mash for 24 hours, and two days later give a second thorough cleaning to the pen. While carrying out this treatment kill off any birds which are obviously heavily infected with the disease. Such birds are unlikely to recover, and are the main source of danger to the healthy ones. Remember, the whole chance of success depends upon cleaning the pen and equipment effectively after each feed of the milk mash.

Coccidiosis of chickens. Affected blind guts (caeca) showing three stages of the disease. (A) Small haemorrhages in slightly enlarged caeca; (B) haemorrhagic contents in enlarged caeca; (C) almost pure blood in greatly enlarged caeca.

Properly soured milk may be used instead of the milk mash described. In this instance the sour milk is given as the only drink available to the chickens for 24 hours, and then a thorough clean-out of the pen made 48 hours after giving the milk. This may be repeated twice, but because of the acid condition of the milk it should not be given in metal drinkers.

It is claimed that treatment with vinegar or Epsom salts has a similar effect to the "milk flush" described above. While vinegar and Epsom salts are cheaper than milk powder, the latter has a very definite value as a food, and is particularly helpful to birds suffering from a check due to disease. The main point to note in this type of treatment is not so much whether milk, vinegar, or Epsom salts is used, but that success depends essentially upon the efficient and regular cleaning out at the times stated. Only by the removal of the coccidia which infect healthy birds can this disease be properly controlled.

Medicinal treatment is rarely satisfactory in duodenal coccidiosis, Poultrykeepers must realise that the best method when well-grown pullets are attacked is that of rigid culling and strict sanitary measures. Any attempt to retain and treat infected birds is not a sound policy, and will in most cases result in greater total losses finally than if an **early** attempt is made to cull out every sick bird. The infected flock should be confined to their house and the litter changed frequently until the infection dies down. Wire-netting must be placed in front of and under the perches to stop the birds having access to the droppings which accumulate during perching hours. Drinking and feeding equipment should be kept clean and thoroughly disinfected from time to time. Poultrykeepers who are in the habit of feeding dry mash are advised to use the wet mash system during an outbreak, and all troughs should be picked up and placed out of the reach of the birds immediately a wet mash feed has been completed. Grain should be fed in a clean trough and not in the litter.

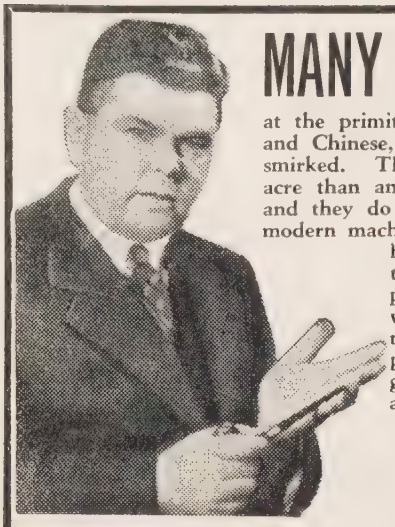
Treatment of Housing and Runs

As soon as a house can be freed of birds after an outbreak of coccidiosis —whether caecal or duodenal—the floor and walls (for the first 18 inches up) should be scraped and thoroughly scrubbed with caustic soda. If the floor is wooden, this treatment should be followed by a coat of creosote or a mixture of two-thirds creosote and one-third kerosene. Care must be taken to clean all dirt out of holes and cracks between boards.

Where a grass or soil run outside the house is suspected of being contaminated the area immediately around or in front of the house should be heavily dressed with quick lime and dug over. The run should then be spelled for as long as is possible.

Prevention

While all birds are liable to be attacked with coccidiosis, it is certain



MANY HAVE LAUGHED . . .

at the primitive cultivating implements of the "Wogs" and Chinese, but in reality the laugh is on those who smirked. The "Wogs" and Chinese grow more per acre than any so-called civilised country in the world, and they do it without artificial fertilisers or orthodox modern machinery. They still scratch the earth as they have done for centuries. Do you know that except for some special crops, the plough is doomed? I suppose you wonder what I'm talking about? For over ten years now I've been advocating to farmers not to plough and re-sow pastures, but merely to give the surface a darn good tearing about, and, where necessary, surface sow.

Now, an American—a Kentucky farmer, Edward Faulkner — has got headlines and leaders in papers and journals throughout America for his "revolutionary" discovery . . . space will not permit of going into full details of Faulkner's findings, but inter alia, he publicises:

(1) Mix into surface soil by implements such as a harrow, everything the farmer now ploughs under.

(2) Organic matter harrowed into the surface becomes a reservoir retaining rainfall from above, and promoting capillary action from below, during dry spells.

(3) Abandonment of ploughing will make artificial fertiliser, lime, and insecticides unnecessary. Fertilising does not improve crop yields—it only decreases the devasting effect of ploughing.

(4) Weeds will be ultimately conquered because they would be killed off by being harrowed under as they come up.

(5) Plant diseases will be conquered because soil poverty means a weak plant, etc., etc.

Faulkner's conceptions are spreading in the U.S.A. "Time" Magazine says: "Many a farmer who reads Faulkner's report may be tempted never to plough again."

Devoting its entire leader column to Faulkner, "The New York Daily News" predicted that Faulkner's book ("Plowman's Folly" published in 1943) . . . "will have as revolutionary an effect upon the human race as any publication we can think of in the last 100 years."

Now the U.S.A. Government has placed the seal of its approval upon Faulkner's revolutionary doctrine — beat your ploughshares into harrows to bring prosperity and plenty to mankind.

The highest ranking American soil expert, Hugh Hammond Bennett, Soil Conservation Director, agreed that the moldboard plough is doomed except for some special crops and uses. In its stead the U.S.A. Department of Agriculture is going to urge upon farmers "Sub-surface tillage" permitting nature, as Faulkner puts it—to renew its primeval design for growth, growth out of dead organic matter, growth of life out of death.

If you will now take your mind back to the old "Wog" plough, you will remember it just scratches and tears up the sub-surface, but the idea is and always has been right. It has retained the fertility of the soil without artificial fertilisers for many thousands of years.

What is the "Bevin" Harrow? In effect it is nothing but a number of greatly improved small "Wog" ploughs in a series, which because of its greater coverage, gets over the ground much quicker, thus saving much labour.

The United States Government is fostering Faulkner's discoveries. For many years before Mr. Faulkner was ever heard of, I have unsuccessfully endeavoured to get the N.Z. Department of Agriculture to try out the same ideas.

I can show you literally thousands of letters from farmers proving that what this country needs most of all is a good scarifying harrow—the "Bevin", which is unique, and not an orthodox implement. Here is just one of the letters:—

Messrs. de Pelichet, McLeod & Co. Ltd., Hastings, on the 8th February, 1944, write: "As you know, we do a big business with grass seed, and this season experimented on this class of work with rather startling results. In one paddock half was BEVIN Harrowed and half was left unharrowed. The yield was 50 bushels to the acre on the harrowed portion and 35 on the other. On two other tests the results were on the same proporion."

I invite you, — no, I go further — I *challenge* you to disprove my theory which has been subsequently confirmed by Faulkner. All you need to do is to purchase a "Bevin" and use a lesser quantity of artificial fertiliser (you will be surprised how little, if any, is actually required). You take no risk because my written money-back warranty guarantees my Harrow, even to results.

For years you have been taught to worship "ARTIFICIAL FERTILISER." I have the figures to prove that nature, and not artificial fertiliser, has governed our production for many years past. I can show you that in years when the greatest quantities of artificial fertiliser were applied, production was not as good as in other years when a lesser quantity of manure plus a munificent nature, yielded more. Granted, in some seasons when there was a shortage of fertiliser plus bad climatic conditions, production decreased, but even last season when fertiliser was short and climatic conditions generally were bad, some of the North Auckland factories increased their production from less cows.

★ Because the "BEVIN" Electrofencer is also unique and the leader in its field, I am sure you will find that the attached coupon will result to your ultimate benefit. It is certainly convenient, so I trust you will fill it in now. Many thanks!

To ALISTER BEVIN,
38 ALBERT ST. (Box 880),
AUCKLAND, C.1.

Please send me particulars of your
"BEVIN" HARROW
"BEVIN" ELECTROFENCER
(Strike out which not wanted.)
and a copy of your **Money-Back Guarantee.**

NAME .....

ADDRESS .....

.....J.A. 15/8/44

that birds of weaker constitution, whatever their age, are more prone to this disease and suffer most if attacked by it. Therefore, **the first essential in prevention is the maintenance of constitution throughout the stock by sound breeding methods and good management.** Breeding from poor stock, small for the breed they represent, and lacking in real vitality, is the first step towards encouraging an outbreak of this disease.

It is also a well-established fact that damp litter and floors give ideal conditions for coccidia, so that for the prevention and control of coccidiosis it is important to avoid dampness at all times in both brooder and laying houses. This rule particularly applies to areas around drinking vessels. As droppings are a source of danger, it will be realised that the large quantities which collect under the perches must intensify this danger where the flock are allowed unrestricted access to such droppings. It is therefore suggested that where coccidiosis has once occurred and may easily break out again the area under the perches should be wired off against the birds in the house. Floor space may be lost, but greater safety is attained.

As a safeguard against contaminated runs annual dressings of quick lime, applied in the winter when the run can be spelled, are advised. The draining of wet runs is a further safeguard against outbreaks.

Where farms have been free from outbreaks of coccidiosis special care should be taken at any time when fresh stock or hatching eggs are introduced. The eggs should be dipped in methylated spirits and allowed to dry before setting, while fresh stock should be placed in a quarantine pen for at least a fortnight and be kept under close observation.

Where Help Can Be Obtained

The need for recognising the disease as soon as possible and then of acting quickly has already been stressed as an essential in effective control. It has also been stated that difficulties arise in recognising the disease if it is not present in an acute form. For these two reasons poultrykeepers are strongly recommended to forward suspected birds—two or three if possible—to the Chief Diagnostic Officer, Animal Research Station, Wallaceville. A thorough examination will be made and a report sent back to the poultrykeeper without delay. If serious losses are occurring it is also recommended that the poultrykeeper seek the services of the local Poultry Instructor by writing him at the Department of Agriculture, Auckland, Wellington, Christchurch, or Dunedin, according to the district. Delay is dangerous—act immediately.

Management of Ewes and Lambs

With the aid of adequate draining, in conjunction with liming and topdressing and the sowing of seeds mixtures containing superior strains of grasses and clovers, a large and increasing number of Southland farmers have reached a stage where their carrying capacity is 5 ewes per acre or better. Lambing percentages on the class of farm under review would reach 120 per cent. in most seasons.

— By —

A. STUART,
Instructor in Agriculture,
Invercargill.

UNLESS steps are taken to deal with the problem of twin lambs, this may prove a source of embarrassment to the farmer towards the end of the season, as generally a much lower percentage of these lambs is able to be fattened off the mothers as compared with the single lambs from the remainder of the ewe flock. Consequently many farmers adopt the practice of removing sets of twin lambs from the rest of the flock soon after lambing, and concentrate these lambs and their mothers on paddocks producing the best feed on the farm.

Mr. P. Fleck, Gropers Bush, has adopted an idea for some years now which has proved to be an easy and effective means of separation, and a great time-saver.

Catching the Second Twin: A cage on runners and no bigger than a kerosene case, but strongly made, with sides and end composed of bird netting, is attached to a "jogger" by means of a lengthy chain. At least 80 per cent. of the ewes will follow their lambs as the cage is pulled forward and through the gateway.

Ewe Following Caged Lambs: For the ewe that will not follow her lambs Mr. Fleck has made provision also, by carrying in his jogger a special crate as illustrated in the photograph. It is in this crate that a dog is normally carried during the time his services are not required in the paddock, or until the crate is required for an obstinate ewe.

Before lambing commences Mr. Fleck subdivides a good paddock temporarily into three sections. For three or four days, depending on the rate of lambing, all ewes and lambs specially branded so that the sets of twins can be distinguished are placed in one section under a distinct colour brand, say, red. For the second section another colour is used, and again a change is made for the third section. By that time the first section of ewes and lambs are ready to be moved to the paddock, which will carry them until weaning time. Under this method a twin branded red which has strayed into a paddock holding lambs branded green can be easily distinguished and returned to its mother through the fence, thereby avoiding mismothering.

Mr. Fleck has moved 13 sets of twins in less than one hour from a 30-acre paddock by his method, which saves the farmer's legs, temper, and time, besides saving the dog. When not in use the cage is carried in the jogger.

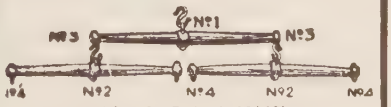
the PRIME ELECTRIC FENCE

The first Electric Fence on the market — still leads because it IS the best. Details supplied on request.

I DEAL OFF JOHN BURNS — THEY'VE GOT EVERYTHING A FARMER NEEDS

Diesel and Petrol Engines, Marine Propulsion Engines, Electric Lighting Plants, Excavators, Pumping Plants, Concrete Mixers, Air Compressors, etc.

SWINGLE TREE IRONS



(Wilson's Patent 16146).

Above Illustration shows a 2-horse set. ntroduced to enable farmers to make up their own trees.

Prices on application. State Iron numbers from above illustration.

JOHN BURNS & CO., LTD.
Auckland, Wellington, Christchurch, Gisborne, Greymouth, Whangarei.

WHY?

Should anyone take the time and trouble and spend large sums of money to raise stock seed, to select and breed pure strains, to supervise with infinite care the production of commercial quantities of turnip and swede seed for N.Z. farmers?

BECAUSE

Turnips and swedes are notorious for cross fertilisation with other members of the brassica family to produce "monstrosity" plants.

Strains will throw back to mongrel types in one generation if not given proper attention. There are few if any seeds more difficult to keep pure and true to type.

THEREFORE

When you order Turnip or Swede Seed

INSIST ON BEING SUPPLIED WITH

N.Z.-GROWN

"GOVERNMENT APPROVED"

TURNIP and SWEDE SEED

APPROVED FOR YOUR PROTECTION

Full Supplies Available from all Merchants

Inserted by Wright, Stephenson & Co. Ltd., Growing Merchants for Government approved Turnip & Swede Seeds.

Saw-Bench for Making Hive Parts

Possibly the greatest economy that can be effected in the establishment and maintenance costs of an apiary lies in the manufacture of the hives and hive parts by the beekeeper himself. Although beekeepers may not be skilled wood-working tradesmen, many have installed and operate some type of a wood-working machine.

— By —
L. H. JOHNSON,
Apiary Instructor,
Palmerston North

THERE are some excellent universal wood-working machines on the market at a price, but if economy with efficiency is to be the first consideration, the beekeeper can save pounds by constructing his own circular saw bench. The one illustrated here is not only economical and simple to construct, but is efficient and safe to operate.

In Fig. 1 the saw-bench without the sliding table is shown.

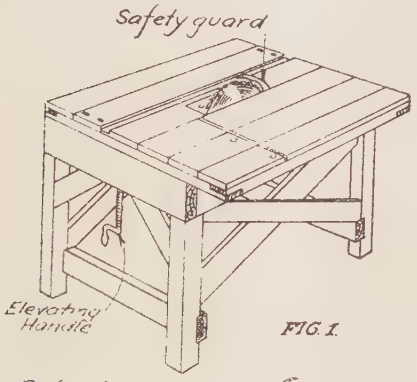


FIG. 1.

Reduced perspective view of saw Bench.

Fig. 2 shows a section through the saw spindle, bearings, and pulley. The table being extended over the pulley increases the safety margin.

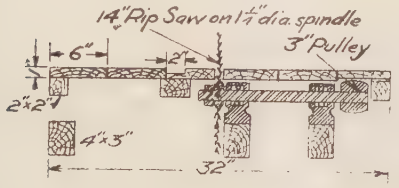


FIG. 2. Section on A A

Fig. 3 shows the side elevation. The elevating table, which is used when rabbeting and grooving, is hinged at the rear and is operated by a screw. An iron plate which is tapped to take the screw is fixed to the main cross bearer, i.e., the 6 in. x 2 in. A fin is fixed to the bench at the rear of the saw (see Fig. 1 marked safety guard). The saw is driven by a belt from a two horse-power electric motor, but a one horse-power motor would be ample to drive a 12 in. saw for cutting timber up to 1 in. thickness. As an alternative the motor could be placed directly below the saw spindle and driven by triple V belts. In this case the motor should be under control by a protective switch in case the saw jams.

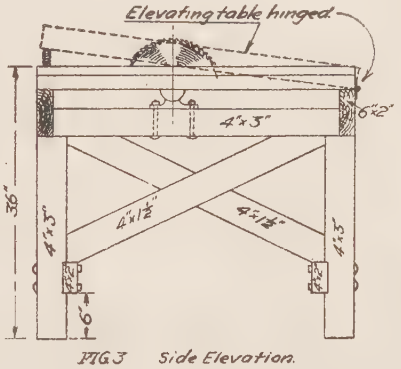


FIG 3 Side Elevation.

Fig. 4 is the plan of the frame of the elevating table without the decking.

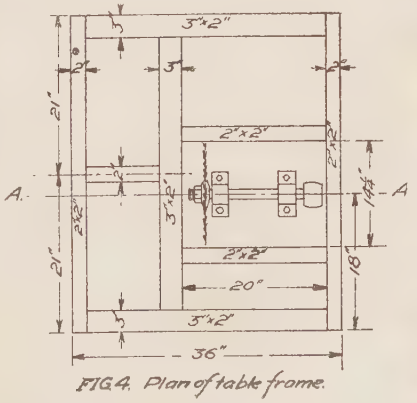


FIG 4. Plan of table frame.

Fig. 5: This sliding table, made with a piece of five-ply wood screwed on to a length of 3 in. x 2 in., is used when crosscutting. The tongue is a 2 in. x ½ in. piece of matai or other long-wearing timber. It needs to be well screwed to the plywood. Provision has been made (see Fig. 1) for the decking board at the left of channel to have the screws set in slotted holes so that it can be moved up to the tongue to take up wear. The sliding stop which is mounted on the 3 in. x 2 in. is a loose flap inside of

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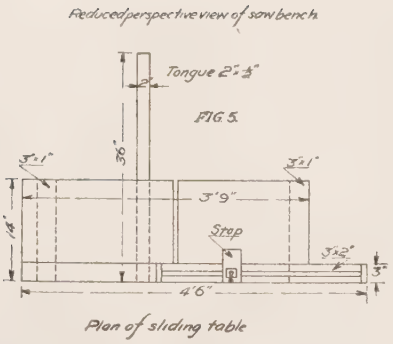

which is a collar with a lock nut, both of which neatly slide on a length of ½ in. steel shafting. In operation the flap can be lifted up to allow cut lengths of timber to be pushed over the table, while the collar remains locked.

Fig. 6 illustrates a fence used when ripping. An iron brace adjustable at the slotted end by a bolt and wing nut provides for lining the fence with the saw. A 2 in. x ¼ in. steel plate screwed to the cross arm of the fence is to fit into the ¼ in. groove shown in Fig. 1, thus ensuring rigidity.

Eight coach bolts 6in. x 3-8in., 2lb. of 4in. nails, and 1lb. of 2½in. nails should be sufficient to fix the bench together.

Pinus insignis timber is now largely used for hive making. Approximate quantities to make a complete hive of 4 supers: 10in. x 7-8in. I.S.D. *Pinus insignis*, 28 superficial feet; 6in. x ¾ in. sawn *Pinus insignis*, 9 superficial feet.

In addition to hive making, this saw would be useful for cutting out numerous other wooden appliances used in the honey house.

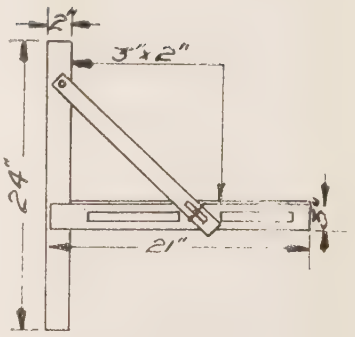

FIG. 6.
Plan of Fence

TIMBER AND MATERIALS REQUIRED.

Bench Frame.	6" x 2"	4" x 3"	4" x 2"	4" x 1½"	3" x 2"	2" x 2"	6" x 1"	3" x 1"	3" x 2"
Legs 4" x 3" O.B.R. sawn 4/3'		1/12						Dress	Dress
Main bearers 4" x 3" O.B.R. sawn 3/3' 2"		1/10							
Front and back bearers, 6" x 2" O.B.R. sawn 2/6'	1/12'								
Bottom leg tie 4" x 2" O.B.R. sawn 1/5'			1/5'						
Braces 4" x 1½" O.B.R. sawn 2/6' 6". 1/4'				1/13' 1/4'					
Table—									
3" x 2" O.B.R. sawn 3/3'					1/9'				
2" x 2" O.B.R. sawn 1/7' 1/4' ..						1/11'			
Decking 6" x 1" O.B.R. sawn 3/7' ..							3/7'		
Fence—									
3" x 2" O.B.R. sawn, dressed 1/2' 1/1' 9"									
Sliding Table—									
3" x 2" O.B.R. sawn, dressed 1/4' 6"									1/9'
3" x 1" O.B.R. sawn, dressed 2/14" ..								1/3'	
Tongue 2" x ½" finished 1/3'									
Five-ply wood 3' 9" x 14"									
Totals in lineal feet	12'	22'	5'	17'	9'	11'	21'	3'	9'

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FARMING IN NEW ZEALAND

Climate and Topography

Climate, topography, soil fertility, and markets have been the determining factors in the development and distribution of the Dominion's systems of farming. This article describes briefly the climate and topography of New Zealand and their bearing on the dominance of pastoral farming.

— By —
MARY AITKEN,
Fields Division, Christchurch

CLIMATE.

THE extremely favourable climate of New Zealand to a large extent accounts for the high agricultural productivity of the country. Owing to its geographic position the winds that reach New Zealand are moisture bearing. The main rainfall division of the country is east-west. The high relief accentuates the rainfall on the west coast, while in the east it gives rise to large areas of relatively low rainfall. The country benefits from an adequate rainfall (Fig. 6). In most of the habitable parts it is from 30 to 75 inches. The efficiency of this rainfall is reflected in the luxuriant nature of the forest cover and the abundant growth of grass. In the North Island the growth of grass continues for the greater part of the year. In the South Island growth is checked during the winter months. In elevated regions and other areas which are little settled the rainfall is over 75in. This precipitation from an agricultural point of view is excessive. In parts of the tussock areas, however, rainfall borders on deficiency. In Central Otago the rainfall is from 10 to 15in. In the semi-arid areas the landscape takes on a dry and barren aspect. There is little seasonal change in the appearance of the vegetation cover.

In general rainfall is adequate and evenly distributed throughout the year. The number of days on which rain falls varies throughout the country (table X). Even in the areas of heavy rainfall the number of rain days is limited. There is no month with less than 1.2in., except in Central Otago.

TABLE X.—AVERAGE ANNUAL RAINFALL.

Station.	Average Annual Rainfall.	No. of Rain Days.
Auckland	45	184
Napier	35	113
Wellington	47	166
Nelson	38	118
Hokitika	114	187
Christchurch ..	26	126
Dunedin	40	161
Invercargill ...	45	194
Clyde	15	77

There is, however, in certain regions a marked seasonal concentration of rainfall. In North Auckland there is a definite winter maximum of rainfall. This tendency is dominant as far south as Kawhia on the west coast. On the east it extends as far south as Banks Peninsula. On the west coast from Kawhia to Fiordland there is a tendency to a maximum in October and a minimum in February, with a secondary maximum again in May. In dry areas, to the east of the ranges, particularly in Central Otago, there is a concentration of rainfall in the summer months. In these interior situations climatic conditions resemble those prevailing in continental areas.

All areas east of the ranges, especially those in the South Island, are subject to strong north-west winds. These are hot, dry winds, which often blow continuously for several days in the summer and autumn months. In the low-rainfall areas these drying winds reduce further the efficiency of the rainfall. The natural vegetation in these exposed areas was the tussock formation which was almost completely devoid of the larger trees.

Rainfall fluctuations from the normal are important for agriculture, as they may determine the success or failure of crops. Twice in Canterbury and Marlborough since European occupation the rainfall record has fallen to half the amount normally received. There is no record, however, of two continuous months without rain. Rainfall variability is highest and most serious in the areas of heavier precipitation. In regions of lighter rainfall a considerable departure from the average may not be serious. Rainfall is most reliable in those areas which receive rain from the westerlies, i.e., Taranaki, the West Coast, and parts of Southland. The suitability of Taranaki for dairying is doubtless related to this fact.

The climate of New Zealand has then a well-distributed and reliable rainfall, falling on a limited number of rain days. It has also a high number of sunshine hours (table XI).

TABLE XI.—DURATION OF SUNSHINE PER ANNUM.

	Duration of Sunshine in hours.
Auckland	2033
Napier	2416
Wellington	2050
Nelson	2510
Hokitika	1918
Christchurch	1967
Dunedin	1711
Invercargill	1626
Lake Tekapo (Mackenzie Country)	2409

Nelson receives the longest duration of sunshine with 2510 hours annually.

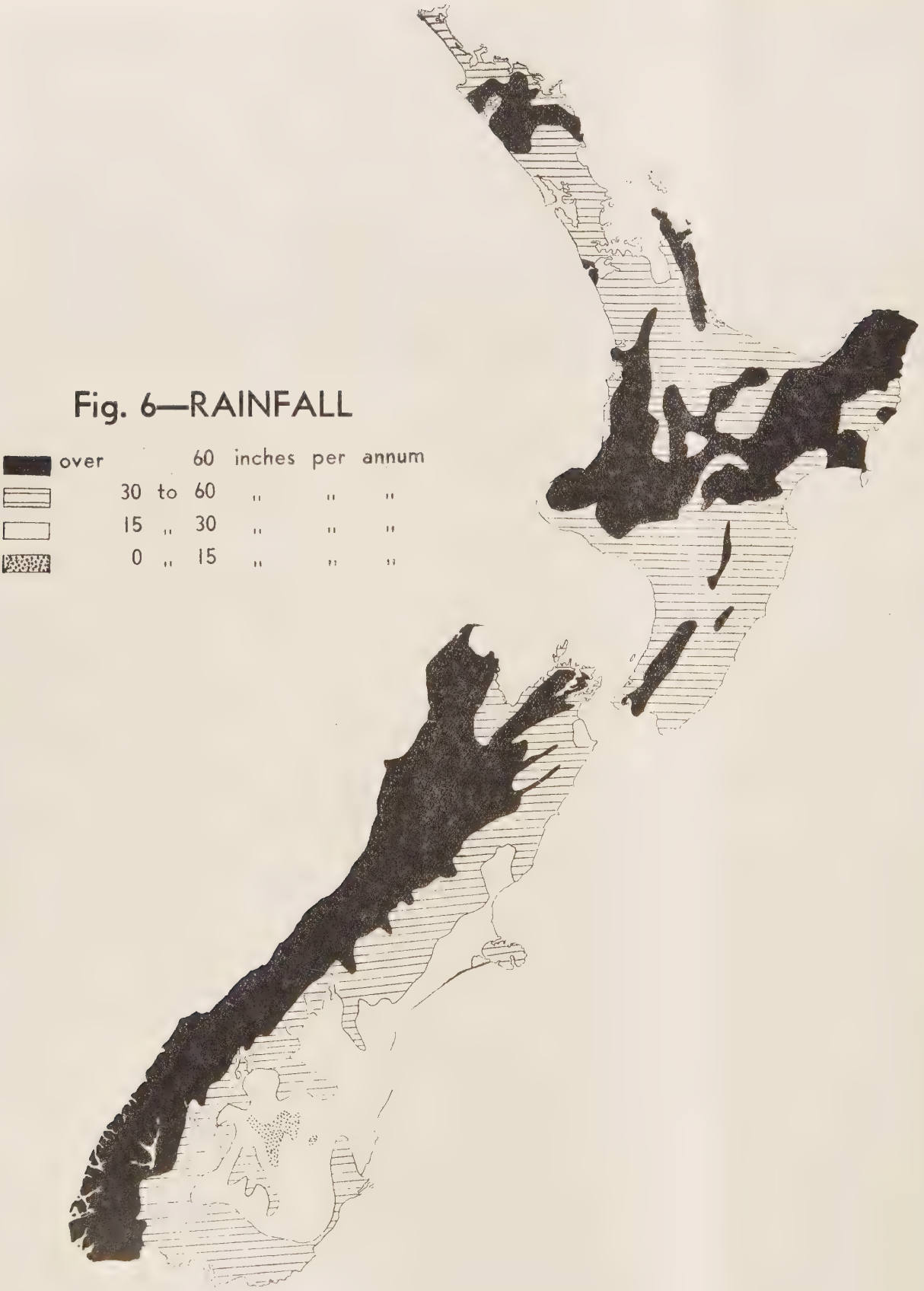
Fig. 6—RAINFALL
over 60 inches per annum
30 to 60 " " "
15 " 30 " " "
0 " 15 " " "

Even Hokitika with 114in. of rain receives 1918 hours of sunshine. This frequent alternation of heavy rain and bright sunshine distinguishes the climate of New Zealand from other parts of the world with a similar type of climate. Brilliant sunshine and sometimes strong wind after rain permit the rapid drying of the ground surface.

There is a definite range of temperature with latitude (table XII). The average annual temperature varies from 59 deg. to 50 deg. In the north citrus fruits and tung plants can be grown. Seasonal ranges of temperature are least in the north, the difference between the hottest and coldest month being 12.5 deg. in the far north.

TABLE XII.—AVERAGE ANNUAL TEMPERATURE.

Station.	Temperature in deg. F.
Auckland	59
Napier	56
Wellington	54
Nelson	54
Hokitika	52
Christchurch	52
Dunedin	50
Invercargill	50
Ophir (Central Otago)	51

In the far north only one ground frost per year is experienced, whereas Ophir (Central Otago) has a range of 25.4 deg. and 192 ground frosts per year. There is also a marked daily range in temperature in both summer and winter.

In conclusion, the following outstanding features of the New Zealand climate may be noted: Winters are mild, there being no continuous snow cover on the low country. Stock do not need to be kept under cover during the winter months, but in exposed positions the provision of shelter is beneficial. The rainfall is adequate and evenly distributed throughout the year. It falls on a limited number of rain days. There is thus a long duration of sunshine hours. The atmosphere is well washed, clear, and free from dust.

TOPOGRAPHY.

New Zealand is largely a mountainous country (Fig. 7). Less than one quarter of its land surface lies below the 650ft. contour. It thus presents a marked contrast to eastern Pacific countries, which have large areas of land below this level. The two islands of New Zealand are divided into eastern and western regions by the main mountain axis, which runs from Fiordland in the South to East Cape in the North Island. Although the mountain barrier is of little use for an intensive type of agriculture it is important as a collecting basin for rainwater, which may be used for hydro-electricity or irrigation.

On either side of the mountain ranges only relatively small areas of flat land occur. These are mainly coastal strips and river valleys. Such lowlands are of limited extent and are not continuous. Other areas of flat land occur at higher altitudes in elevated inland basins. These lands, however, are outside the denser areas of settlement. Much of it, though occupied, is still unimproved land. Thus it is seen that the flat land in New Zealand is but a small proportion of the total area.

The chief areas of lowland in the North Island are as follows:—

1. **The Manawatu - Horowhenua Coastal Plain:** The Manawatu Plain stretches from the Manawatu Gorge to the coast. From the gorge to Palmerston North the plain slopes steeply, but between the town and the sea the slope of the plain is more gradual and the river follows a winding course across it. This part of the plain is separated from the sea by a line of sand dunes. The rainfall on the coastal belt is sufficient for dairy farming on the light sandy soil.

Southwards the coastal plain becomes narrower and is then known as Horowhenua Coastal Plain, as it is largely contained within the Horowhenua County. This plain consists of a series of terraces along the foot of the highland. On its outer edge it is fringed by sand dunes and swampy hollows. These hollows, many of which were formerly covered with Phormium flax, are numerous in the vicinity of Levin.

2. **The Taranaki Plain:** The Taranaki Plain is an elevated plain ending at the sea in cliffs. It is cut by the rivers which emerge from the hill country. At the present level of the rivers there are small areas of plain lying at a lower level than the general elevated surface of the country.

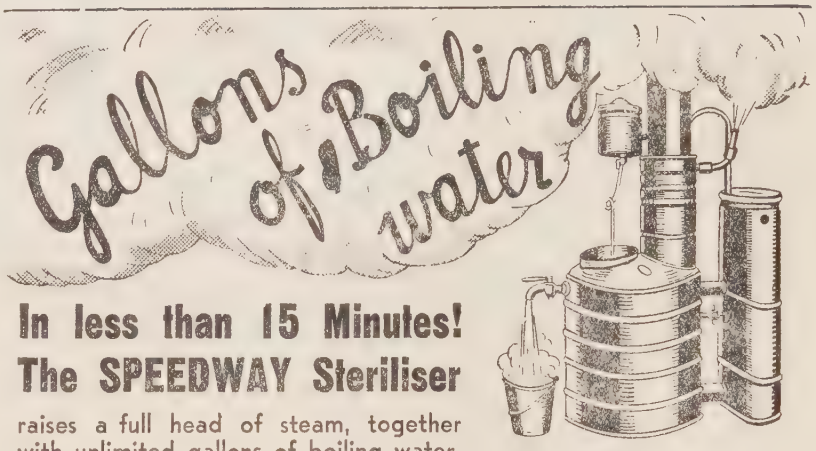

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FIG. 7

3. **The Wairarapa Lowland:** This lowland is a long valley running parallel to the high country and separating it from the coastal hill country. It is part of the gravel-filled lowlands which stretch northwards to Hawke's Bay.

4. **The Heretaunga Plain**: This plain is the most extensive area of flat land on the east coast. It is roughly triangular in shape and is formed of alluvial sediments deposited by the rivers which cross the plain. Since the earthquake of 1933 much land has been reclaimed from the Ahuriri Lagoon.

5. **The Waikato - Thames Hauraki Plains:** These plains are composed mainly of volcanic sediments derived from the plateau. It may be mentioned here that the plains of the North Island are usually composed of finer sediments than those of the South. A considerable portion of the area was formerly swamp. Where this has been drained it now makes good farming land. This lowland area is separated by a low range from the small disconnected plains of the Bay of Plenty.

In the North Island the main units of the high country are as follows:—

1. **The East Coast Ranges and Hill Country:** These mountains extend from Cape Palliser to East Cape, a distance of some 350 miles. Throughout its southern section the ranges are narrower than they are to the north of the point where they are cut by the Manawatu River. From this river gorge they widen out, the Kaimanawa Range extending westwards towards the volcanic plateau as a wide belt of rugged mountain country. On the eastern side of the main range there is an extensive belt of hill country stretching to the coast both to the north and south of Hawke's Bay. The northern ridges of this soft-rock hill-country lose elevation seawards. The slopes facing inland are steep, while larger and more gradual slopes face the coast. In these valleys there are few large rivers and it is only in their lower valleys that there are any areas of flat land. The largest area of flat land is the Poverty Bay Flat formed by the valley of the Waipaoa River. To the south of Hawke's Bay the main ranges are usually separated from the coastal hill country by the chain of gravel-filled depressions referred to previously.

2. **The Volcanic Plateau:** This plateau occupies the greater portion of the middle of the North Island. From it radiate the main systems of river drainage of the North Island. The plateau is built of volcanic material, its surface being relatively even, but often broken by volcanic cones and irregular ridges.

The greater part of the plateau surface is unproductive and unsuited to agriculture. Farming has been successful in a few areas but is not characteristic of the plateau as a whole. Much of the country surrounding the plateau provides good grazing, tongues of land such as the Rangitaiki Valley penetrating inland to the plateau.

3. **Inland Wanganui - Taranaki Hill Country:** This tract of dissected plateau country fringes the western boundary of the volcanic plateau from which it stretches to the volcanic cone of Mt. Egmont. The hill country surrounding it is composed of soft rocks. The highest ridges are those further inland and overlooking the volcanic plateau. In the east it rises to 3000ft., while in the west it is under 2000ft. From the highest ridges there is an even slope of the land towards the coast. The whole plateau has been intricately and deeply dissected by streams. The ridges between the stream valleys have sharp crests and steep-sided slopes. It is important to note that this area of weak rocks and steep hill slopes is also one of high rainfall. The soil was formerly protected by a dense forest cover. Today much of this type of land has been cleared. In places it is used for the grazing of stock; in others it is reverting to second growth.

4. **The North Auckland Peninsula:** This unit includes the North Auckland Peninsula and the smaller Coromandel Peninsula. The surface of the latter is mainly in native bush and scrub and is of little use for farming. The country of both these areas is complex in character. The chief areas of flat land are those along the rivers in the coastal areas. The region is mainly an upland of low elevation, generally below 600ft., but there are several peaks rising to 1000 and 2000ft. The region consists mainly of soft rock uplands forming undulating country. There are also outcrops of resistant rocks, chief of which are the volcanic rocks forming outstanding and resistant masses. The coastline of the peninsula is often irregular, there being long indented inlets with extensive estuaries and mud flats. There are also large areas covered with sand dunes, e.g., those along the Ninety Mile Beach and in the far north.

The chief areas of lowland in the South Island are as follows:

1. **The Nelson Lowland:** This lowland consists of a v-shaped area of land. It is divided into two sections separ-

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FIG 7

ated from one another by the Moutere Hills, which are a low upland. The valley plains of the Motueka and Waimea Rivers to the east and west of the hills respectively comprise the best agricultural land, the higher land between them being poorer country.

2. **The Marlborough Plain:** This plain is bounded on the west by the mountains extending to the sounds country. Towards its upper end the valley plain of the Wairau is built of coarse sediments, but nearer the sea the plain is composed of finer sediments. The lower sections are flatter and were formerly swampy.

3. **The Canterbury Plains:** The largest unit area of flat land in New Zealand is formed by the Canterbury Plains, stretching from Amberley to Timaru. It widens in its middle zone to a distance of 40 miles and narrows towards either end. The plain consists of an immense thickness of gravel deposited by the rivers. These gravel deposits are thickest and coarsest close to the mountain upland. In general they are covered by a layer of fine material sufficient in depth to provide fertile soils suitable for the production of cereal and forage crops and of good sheep-farming pastures. Across the surface of the plain the main rivers have formed wide river-beds over which they are constantly changing their course. Around the coastal margin of the plain are fringes of finer sediments which also occur in the slight depressions between the river-beds. Around Christchurch there were areas of swamp. These have now been drained and form good heavy land. The remaining type of land on the plains is a narrow belt composed of beach ridges of sand dunes extending from the mouth of the Waipara to Banks Peninsula.

4. **The Southland Plain:** The Southland Plain is formed of extensive deposits of gravel and silt. This is a highly productive region with high returns per acre, but its high productivity is possibly more closely related to its climate than to its soil formations.

5. **The Westland Plain:** This consists of a narrow and discontinuous coastal plain stretching along the western side of the Southern Alps. The lowland area often extends inland as along the valley of the Buller River.

The main areas in the South Island high country are as follows:—

1. **Fiordland:** This area covers the southern and western part of the island. It is mainly mountainous country with flat-floored valleys. Much of the land is over 5000ft. It is agriculturally unproductive, its greatest value lying in its scenic attractions.

2. **The South Island High Country and Foothills:** This high country stretches from the northern boundary of Fiordland throughout the entire length of the island. The ranges are highest along their western margin, their bush-covered slopes rising steeply from the Westland Plain. On the tussock-covered area on its eastern side sheep may be grazed almost up to the snowline in the summer months. On the eastern side there is a belt of foothills country of lower elevation than the hard rock.

Highland: Hill country ridges extend to the coast in Otago and Southland, where they alternate with areas of softer rock and river valley plains. Banks Peninsula forms yet another isolated area of South Island hill country. It is separated from the main belt of hill country by the Canterbury Plains. This peninsula consists of an old volcanic cone which has been dissected and worn down by erosion. On its outer side slopes are long and gentle till the summit is reached. The inner slopes facing the harbours of Akaroa and Lyttelton are much steeper.

Throughout the hill country there is little even land. Although this land is occupied it is still largely unimproved land. The tussock-covered plains of the Mackenzie Country provide a good example of this class of land. Other areas of flat land, a proportion of which is cultivated, occur in the Waikari, Culverden, and Cheviot basins of North Canterbury.

3. **The Central Otago Ranges and Plains:** The Central Otago ranges are of lower elevation than those of the high country. They are separated from one another by basin plains which lie at an elevation of from 1000 to 2000ft. They have steep, sharp faces overlooking a depression, while their back slopes are inclined at a lesser angle towards a neighbouring depression. As Central Otago is an area of low rainfall a great deal of land on river terraces is 200 to 300ft. above the water table. As the present course of the rivers is at a lower level than the flat tops of the surrounding terraces the irrigation of this land is made difficult. It would entail the building of dams and the digging of water races. Factors such as these have operated against irrigation in the drier areas. Moreover the amount of land suitable for irrigation is only a small proportion of the total area.

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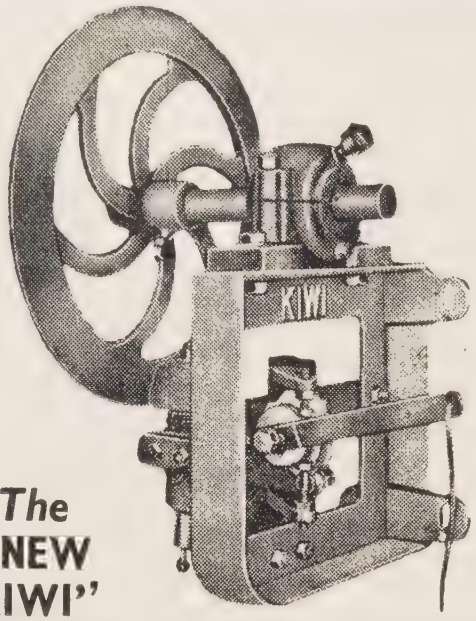

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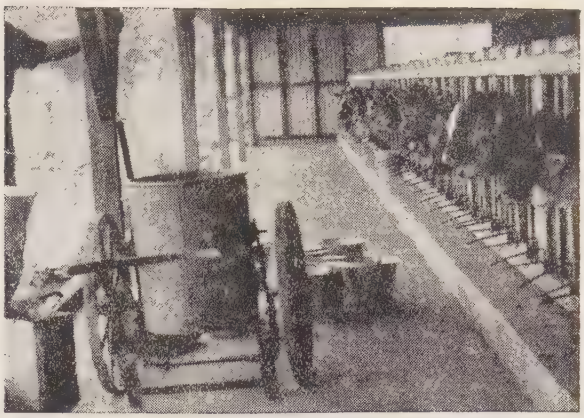


Calf-feeding bails at Ruakura.

The importance of laying a good foundation for the young animals which will later be the milking herd is generally realised. The method most suited to the healthy growth and development of the young bovine is that under which the cow suckles its own calf. That is the system followed in the rearing of calves of the beef breeds, and little or no trouble is experienced with these, at least after weaning. The important factors are that the calf is fed little and often; the milk is at a constant temperature; there is no tendency to overfeed, as the calf is at no time unduly hungry, and the milk goes straight from producer to consumer with no intermediaries in the shape of buckets and milking machines which may introduce contamination.

SUCH a method is not applicable in the case of the dairy breed calf, but as far as possible should be imitated. Feeding three times a day is practised by some pedigree breeders and is a help in reducing the amount of indigestion and scours. Where twice-a-day feeding is necessary the amounts fed should be measured, milk should be fed as soon as possible after it is drawn and not allowed to get cold, and calves should be fed separately so that the fast drinker does not get more than its share and vice versa. Proper washing out and scalding of feeding utensils should be carried out regularly.

To a considerable extent the vigour and vitality of the calf at birth will depend on the feeding of the mother during pregnancy and on the health of her reproductive system. Calves born with the seeds of infection already sown, or with their vigour impaired by deficiencies in the diet of the mother, will be difficult to rear, whatever system is adopted.

First Milk Beneficial

In most dairy herds the heifer calf which is to be reared is left with the mother for the first two or three days. This is probably best both for the mother and the calf. The udder is not completely emptied and the calf gets the first of the milk, the colostrum or beastings, which has a laxative effect and likewise contains protective substances which increase the calf's resistance to certain infections. The stump of the navel cord—frequently a point of entry for infection—has a better chance to dry up and heal over in comparatively clean surroundings. Some dairy farmers, however, prefer to take the calf away at once, believing that the cow is less upset than if she is allowed to suckle the calf and become attached to it for a day or two. If this is done, care must still be taken that the calf is given the colostrum for the first meal or two.

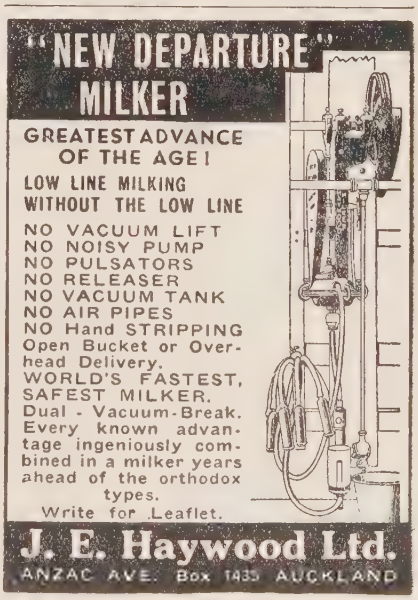
Young calves will usually quickly learn to suck a finger immersed in a small amount of milk, and from that will learn to drink.

The amount of milk fed should be governed rather by the calf's size, breed, and weight than by age. Provided that colostrum is given first, the quantity should not exceed a quart daily, given in two feeds, for the first two or three days, then gradually increasing till about one gallon per day is fed; but the amount fed should not exceed 1½ gallons per day during the first two months. Some of the digestive troubles occurring in young calves are due to overfeeding during the first fortnight. Another rule is to feed 10 per cent. of the calf's weight at the end of the first week.

Cleanliness Important

Cleanliness of surroundings is very important during the first two or three weeks. Housing is desirable, and in colder climates essential, but it must be clean and bedding dry and clean. A calf is better tethered outside on the sunny side of a hedge than confined in a dirty, dark house. Young calves will pick up and chew any loose straws or other objects available, and in a dirty house this is a good source of infection. In many cases calves are allowed to run free from birth and, provided the climate is not too severe, the area is clean, and shelter available (either an open-fronted house or a thick hedge on the windward southerly side), such a system is quite satisfactory and is labour-saving.

Where home separation is in operation calves are usually switched on to skim milk at an age governed largely by the owner's desire to do his calves well. The longer they receive whole milk the better, but after three weeks part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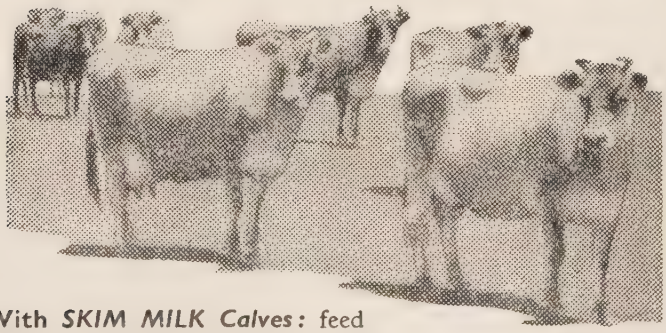

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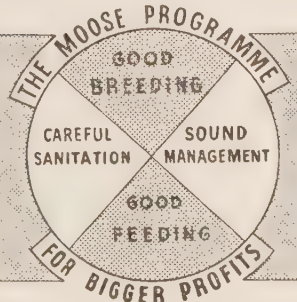

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of it may be replaced by skim milk and this regularly increased until by a month to six weeks they are receiving skim milk alone. The butterfat is important in two ways; it is a food and could be replaced by a small allowance of pollard or other starchy food, and it contains vitamins A and D in varying amounts, depending on the diet of the cows. Vitamin A is probably the more important at this stage of the animal's life, but an alternative source would be young growing grass, and where calves are running out they commence to graze about a month old. Where calves are confined to houses it would appear that either the whole milk should be continued longer or a small ration of cut grass fed after a month old. Vitamin D is important in govering bone formation. It is present in good-quality hay, and exposure to sunlight also helps bone formation. It thus appears that skim milk can be used satisfactorily after three weeks old, provided the calves have access to fresh green feed and exposure to sunlight, with a small allowance of a starchy food.

Whey-fed Calves

Suppliers to cheese factories have to rely on whey as the basal diet. As whey is deficient both in butterfat and in flesh-forming substance it requires supplementing with a suitable protein food. Meat-meal has been found satisfactory and there are proprietary balanced calf meals which give good results. The preliminary period on whole milk is important, and the change over to whey should be made gradually, adding small amounts of meat-meal at first. A useful table (reprinted below) was issued by Lincoln College some years ago showing the amounts fed and rate of change from whole milk to whey. Calves had whole milk for 10 days, whole milk and whey and meat-meal for the next 10 days, and from 3 weeks on received whey and meat-meal only as follows:—

Age of Calf. Days.	Whole Milk. Pints.	Whey. Pints.	Meat-meal. Ounces.
2	2¼	0	0
4	2¾	0	0
6	3	0	0
8	3¼	0	0
10	3	¾	½
12	3	1½	¾
14	2¼	3	1½
16	1½	4	2¼
18	¾	5	2½
20	—	6	3
22	—	6½	3¼
24	—	7½	4
26	—	9	4
28	—	9	4
30	—	9	4
Weeks.			
5	—	9	4
6	—	10	5
7	—	10	5
8	—	10	5
9	—	10	5
10	—	12	6
11	—	12	6
12	—	10	5

Access to good grazing after 3 weeks old will to some extent compensate for lack of protein in the whey.

Feeding Methods

In some cases calves are fed in troughs. Whilst this is a labour-saving method, it is not ideal. Even where milk alone is fed the fast-drinking calf gets more than its share, and if meal is given in addition it is not possible to ensure that each gets its proper allowance. In other cases calves are hand-fed by buckets in the paddock. Where food is carried out calves are often seen sucking each others' udders. This is not desirable as there is some suspicion that injury to the teat and udder may result. A more satisfactory method is the use of a feeding bail where the amount fed to each half can be measured and regulated. If a little dry feed or grain is added when the milk is about finished, the sucking habit is largely overcome. In any case, if the calves are left in the bail for a short period after feeding, ear sucking only can take place.

Weaning

Calves are usually finally weaned from skim milk or whey feeding when about four months old. Where calves are on good grazing at this time and have been trained to eat a little hay weaning—always a critical time for any young animal—may not prove upsetting. Feed once a day for a few days and see that a supply of good drinking water is available, since they miss the liquid as much as the solid constituents of the milk feed. On the average dairy farm there may not be much choice of paddock, but there may be one available from which a hay crop has just been taken.

From weaning time till March calves as a rule do well. When the autumn rains come parasitic trouble may appear. On certain farms, indeed, this may be in evidence even earlier, and it is necessary to institute a drenching programme from weaning time onwards. This should in any case commence not later than the middle of March and drenching should be carried out every three to four weeks. Parasitic disease is insidious, and once the animal is debilitated by worms drenching frequently fails to save its life. Any reliable worm remedy may be used. Good nutrition is almost equally as important as drenching in combating parasitic disease. During the late autumn, when the pasture growth may be soft and lush, good hay should be available. In the winter if a concentrate of some type can be fed, even as little as half a pound per day, so much the better.

At the Ruakura Research Station it was found that calves run ahead of the cows in rotational grazing did better and contracted a much lighter parasitic infection (drenching being unnecessary) than those confined to permanent calf paddocks.

Bails and Houses

Combined feeding bails and houses may be constructed to any degree of elaborateness. The more permanent the structure the greater need to consider drainage and maintain cleanliness. Such layouts are justified in dealing with pedigree animals. A design for a simple set of feeding bails, with concrete yard, for 10 calves is illustrated. It can probably be modified or extended to suit any particular requirement. The use of bails educates the young animal for the milking shed and they provide a convenient place for such operations as vaccination for blackleg and contagious abortion. If a shed is required in association with bails, it should face the north to admit sunlight and have front closed with half doors only. One 12 ft. 6 in. by 9 ft. would accommodate at least 12 calves; height need not be more than 6 ft. 6 in. in front. The floor should be close tongue-and-grooved timber with a fall to the front. Alternatively, as previously suggested, a rough open-fronted shed for shelter in cold or wet weather may be provided, quite apart from the bail outfit.

Some Calf Diseases

Infectious white scours, a condition seen in young calves within a few days of birth, is not so common in New

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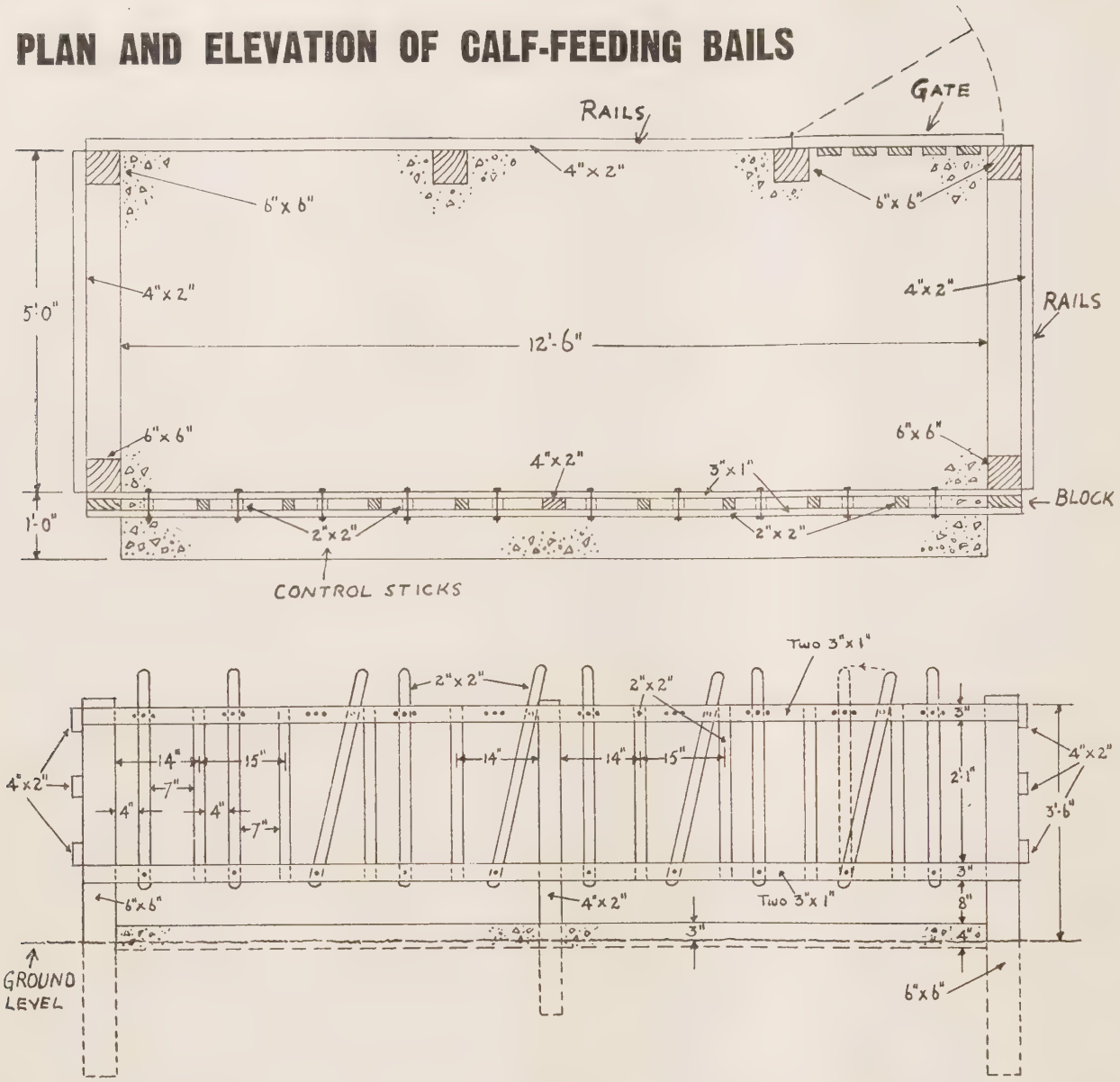
PLAN AND ELEVATION OF CALF-FEEDING BAILS



Zealand as in older countries. It is a bacterial infection, and is more likely to be found where numbers of calves are kept together, where permanent housing is used, and sanitary conditions are faulty, and is apparently influenced by the diet and health of the cows before calving. Treatment is often unsatisfactory, though it is recommended that newly-born and healthy calves should be kept away from those infected and from contaminated houses and yards.

Most of the white scour seen here has its origin in indigestion, due to overfeeding or faulty feeding, though bacterial infections also play a part. Affected calves lose condition rapidly and deaths are common.

The milk ration should be stopped for a day, allowing a little water to

DETAILS.

Dimensions.

YARD: 6' x 12' 6" concreted, including 1' in front of bails, 4" thick.
Bails in front for 10 calves.
Fenced on 3 sides, 3 4" x 2" rails to height of 3' 6" above ground level, 3' 3" above concrete. Access by gate at back.

BAILS: Top and bottom made with double lengths 3" x 1", 2" apart to take control sticks and supports which are of 2" x 2" hardwood fencing battens.
Width per calf 15", slightly less for 2 end and 2 central bails.

MATERIALS.

BAILS: 4 13' 6" 3" x 1", 1 post 4" x 2", 8 battens 2' 7" 2" x 2", 10 battens 3' 3" 2" x 2" (control sticks), 4 blocks 6" x 3" x 2", 10 $\frac{3}{8}$" bolts and nuts (bottoms of control sticks), 10 $\frac{3}{8}$" bolts (to peg control sticks).

YARD (4" x 2" rails on 3 sides): 3 12' 4" x 2", 3 9' 4" x 2". **POSTS:** 6 5' 6" 6" x 6".
CONCRETE: About 20 cub. ft.
GATE: 1 12' 4" x 2", 1 12' 4" x 1½".

which a small pinch of salt is added; bring back to half milk and half water the following day. If medicine is required, a simple dose of 2 oz. of castor oil or raw linseed oil with a level dessertspoonful of baking soda and a few drops of lysol, shaken up with an ounce of water, may be given. The addition of a little limewater, made by mixing a shovelful of burnt lime in a bucketful of water, allowing to settle, and using the clear top fluid at the rate of half a pint per calf, added to milk, is useful for the checking of an outbreak.

In older calves scouring may be set up when they commence to eat soft spring grass. Restrict this and feed a small ration of hay.

Redwater. A number of calves may die rather suddenly and unexpect-

edly from this imperfectly-understood complaint before the cause is suspected. A post-mortem examination of a dead calf may reveal dark red urine in the bladder, or the condition may be detected in the live animal. Affected calves are weak and anaemic, the mouth and lining of the eyelids being pale and bleached. Infection may appear at the time calves commence eating grass, though sometimes it is evident when they are still on milk alone. The cause is probably faulty feeding. Restrict the grazing or put in a barer paddock and allow a little hay for older calves. Ration milk strictly, adding a teaspoonful of salt to each calf's feed, plus limewater. Give a dessertspoonful of vegetable turpentine in a little oil or milk to affected animals.

Calf diphtheria. This is not common in New Zealand. It has no connection with the human disease, but is an infection of the mouth and throat by a common dirt germ, *bacillus necrophorus,* and is more likely to be seen in dirty conditions. There may be some swelling of the throat, difficulty in breathing, and sometimes a loud roaring sound made during breathing. Examination of the mouth may show ulcers and shreds of dead tissue, and an offensive odour is present. Affected calves should be isolated to prevent spread via buckets, etc. Treatment is difficult and unless calves are valuable slaughter may be advisable. If obtainable drugs of the sulphanilamide type, applied as a powder to affected areas, will give good results; otherwise spray the throat with a weak solution of condy's fluid or other reliable antiseptic.

Blackleg. So far this disease in calves is confined to the Taranaki and Auckland Provinces. The causal germ is present in the soil. Calves may be seen lame, but are more often found dead. Just after death there may be a definite gas-distended swelling of muscle tissue of the hind quarter or shoulder region, though general swelling up of the body occurs fairly soon. The disease is a scheduled one under the Stock Act. Preventive vaccination is carried out by inspectors of stock in infected areas.

Worm parasites. Lungworms and stomach worms are largely ill results of permanent pastures. The adults present in the animal's body pass out myriads of eggs, and the young forms which hatch out may remain alive in the pasture and capable of reinfecting calves for many months. Good balanced feeding of the calves will largely reduce their susceptibility to parasitic attacks, while frequent changes of paddock for the other calves will limit the amount of infection picked up.

Lungworm is not common, but outbreaks may occur occasionally, even in calves three or four months old. Affected calves show distressing persistent coughing whenever they are disturbed. Effective treatment requires veterinary assistance, since drenching is of little value.

Stomach worm is more often serious after the weaning stage in the autumn and winter. Calves affected become poor and anaemic and scour. Good balanced feeding and frequent changes are important in the treatment, and routine drenching with a reliable remedy such as bluestone-nicotine will reduce the worm load. Where calves are already debilitated too much cannot be expected from drenching, which, to be effective, should be commenced early on counry where worms are a recurring trouble. A bonemeal salt lick should always be available to calves through the autumn and winter.

Ringworm is not an uncommon skin affection. While unsightly and readily infectious both from calf to calf or by way of rubbing on posts, etc., it does not affect the animals' general health. Its presence is indicated by the occurrence of circular flat scaly elevations about the size of a threepenny piece to a half-crown on the face, ears, or body. Its chief importance lies in the readiness with which it is communicated to the hands or arms of attendants. Isolated lesions may be treated by soaking well with tincture of iodine. If more extensive, a 5 per cent. solution of bluestone may be scrubbed into the patches. Be sure to thoroughly wash hands and arms at once after handling.

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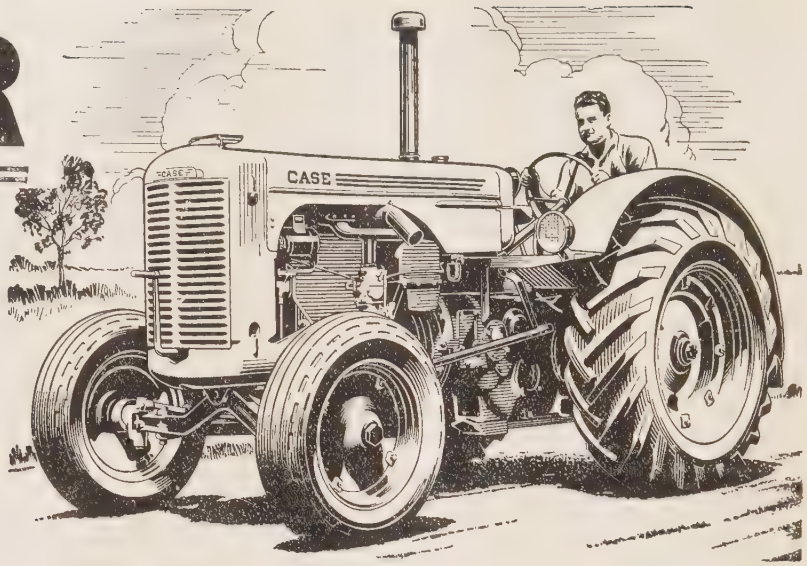

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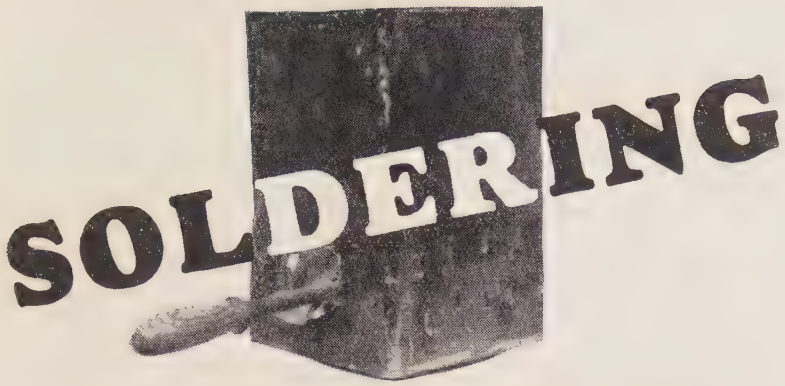


While the process commonly known as soldering or joining metals by the fusion between them of an alloy called solder is universally practised, not much knowledge of the actual procedure is held by the layman. The following notes have been prepared to give a better understanding of the operating conditions essential to success.

(Contributed by the Public Works Department.)

Definition

THE process of soldering is divided into two classes:—

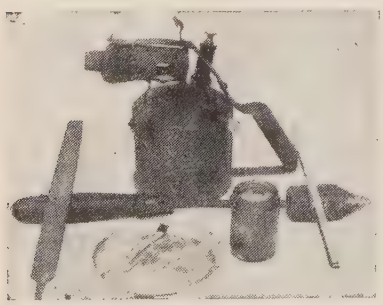
(a) Hard soldering.
(b) Soft soldering.

(a) Hard solder has a melting temperature that cannot be attained with a soldering iron, a blowpipe or torch flame being necessary. Brazing and silver soldering are both hard soldering processes.

(b) Soft solder has a comparatively low melting temperature, being an alloy of tin and lead in varying proportions depending on the nature of the work. A soldering iron can be used to melt the alloy and heat the work. It is with this section of soldering that these notes deal.

Soft Soldering

Soft soldering produces in the metals to be joined a surface union only; that is, the solder adheres to the faces in contact in much the same manner as an adhesive sticks to metal. With the assistance of fluxes, however, the contact is made so intimate that some force is necessary to break the joint, which may be further strengthened by suitable tonguing or otherwise interlocking parts to receive the greater portion of the strain.



Equipment: File, iron, blowlamp, brush, tinning plate, flux, solder.

The equipment necessary for soft soldering comprises:—

1. Source of heat: blowlamp, gas flame, etc.
2. Cleaning tools: file, scraper, etc.
3. Soldering iron: weight suitable for work.
4. Solder: type suitable for work.
5. Flux: type suitable for work.

Procedure

The first process is to thoroughly "tin" the point of the soldering iron.

Left: **A burnt iron.** ***Right:*** **A tinned iron.**

This means that all faces of the point of the iron that come in contact with the solder and work must be thoroughly coated with solder. This is done by heating the iron to working temperature (i.e., a temperature at which it will readily melt the solder), thoroughly cleaning all faces with a piece of emery stone or a file, and, while feeding solder on the point, rubbing the faces on a block of sal-ammoniac or in a small quantity of one or other of the patent fluxes, held in the lid of a small tin.

Care must be taken during the subsequent soldering and repeated reheating of the iron not to overheat, otherwise all the "tinning" will be burnt off and the process will have to be repeated.

The object of "tinning" the iron is to present a surface of molten solder to the solder stick when applied and also the work, thereby assuring quicker melting of the solder and instant application of molten solder to the work as the iron retains a certain amount of solder adhering to it.

Two essentials in successful soldering are cleanliness of the surfaces to be united and use of the correct flux.

Heating the iron.

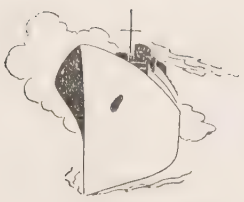
Although work may be filed or scraped perfectly clean and bright, this is not the kind of cleanliness which is alone sufficient; there is nearly always a film of oxide present, forming as the filing or scraping is finished, and the flux is used to dissolve this and prevent more from forming. Then, and

Cleaning the iron.

not until then, will the molten solder spread over the faces in the intimate contact necessary.

Having "tinned" the iron, the ordinary procedure in making a joint is

Tinning the iron.



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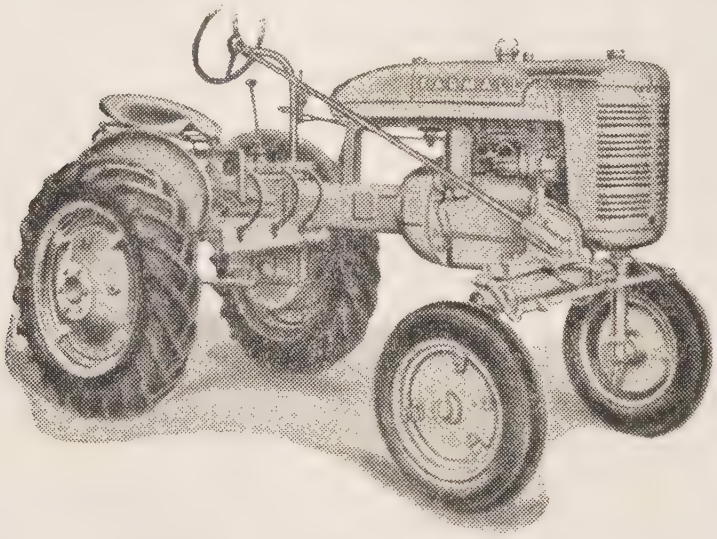

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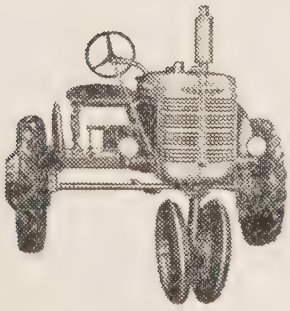

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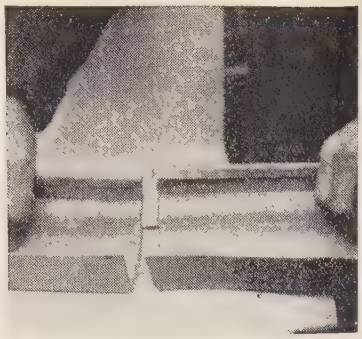
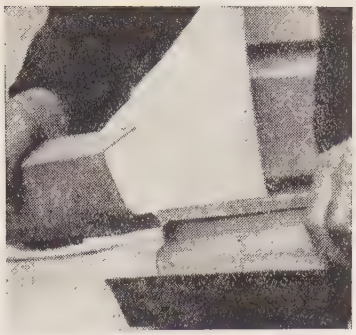
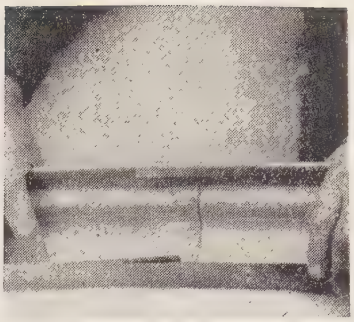


Joining spouting (first stage). Note opened roll on piece on right.



Joining spouting (second stage). Slide roll of one piece, inside roll of other.



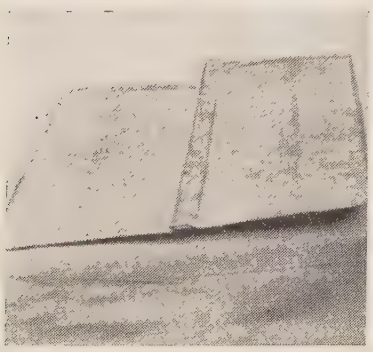
Joining spouting (third stage). Close pieces.

first to clean the surfaces by filing or scraping, apply the flux, and then, holding the solder in one hand and the heated iron in the other, draw the solder along the joint with the iron touching it. This will cause a line of molten solder to run. The "bit" or iron is next moved up and down the joint to spread the solder, and, by the transmission of heat, to make it thoroughly penetrate the joint.

Equipment

1. **Source of Heat.**—Whichever source of heat is chosen a clear flame or fire is necessary so as not to dirty the iron.
2. **Cleaning Tools.**—A plumber's shave-hook, a three-cornered scraper, or an old knife will be found useful.
3. **Soldering Iron.**—For most work a heavy iron is preferable to a light one, as it retains its heat and so gives longer use before re-heating.
4. **Solder.**—Can be purchased in normal times containing different percentages of tin and lead alloy. Solder with 50 per cent. tin and 50 per cent. lead, commonly known as 50-50, or tinsmith's solder, is a fine solder used for high-grade work. Ordinary commercial solder contains about 40 per cent. tin and 60 per cent. lead, and is more suitable for plumber's and gas-fitter's work.

A folded joint (first stage).



A folded joint (finished).

Fluxes

There are many fluxes employed, including:—

Tallow (useful for lead and pewter).

Resin (for lead-compo pipe, copper, tinned brass).

Hydrochloric acid or spirits of salts diluted (for zinc and galvanised iron).

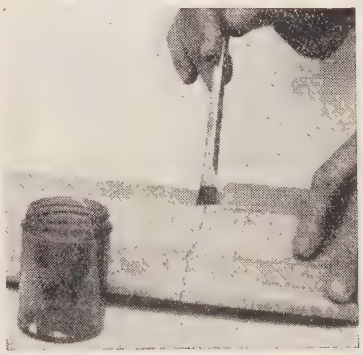
Chloride of zinc or "killed spirit."

The last-named is the most convenient for general use, being suitable for tin-plate, tinned iron, new zinc, copper, and brass.

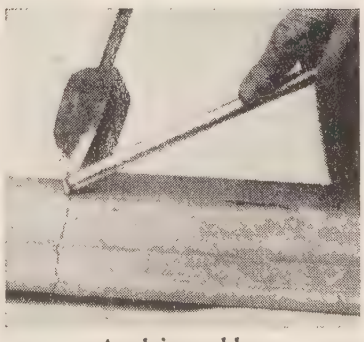
Chloride of zinc is made by dropping clean pieces of zinc into hydrochloric acid, letting it stand for a while, and adding more zinc at intervals until the effervescence has ceased. The addition of a small amount of sal-ammoniac will improve the flux.

Some propriety fluxes are excellent for general work, while others are not as suitable.

For work where the flux must be controlled, as in radio work, flux-cored solder such as "resin core" can be used.



Applying flux.



Applying solder.

Cleaning and Jointing

Cleaning.—New galvanised iron requires no other cleaning than the application of diluted hydrochloric acid, which is also used as the flux.

Brass and copper may be cleaned by the application of chloride of zinc while the metal is hot.

Jointing.—All metals to be jointed should be thoroughly tinned on the sides to be mated and then jointing can be done by the application of the hot iron only.

Bearing these points in mind and having chosen the right materials, the layman should be able to do a satisfactory soldering job, but as with most work of this nature, proficiency is gained by practical experience.

The various types of plough, their functions and care, maintenance hints, and a section of general methods of measuring out the land, striking out, and finishing are features of Bulletin No. 185, "Ploughs and Ploughing," which is available free from offices of the Department of Agriculture.

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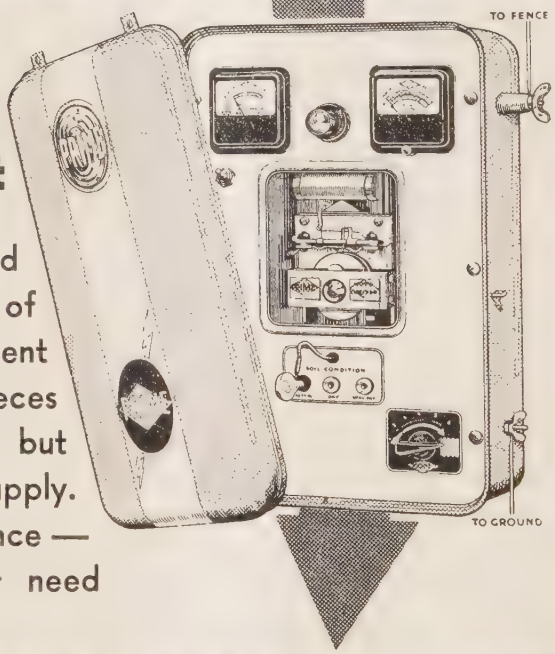

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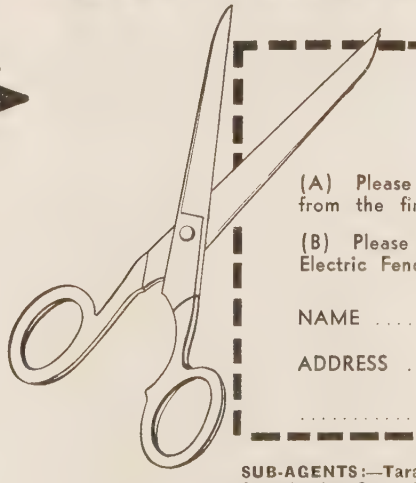

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CHEAP GRASS SEEDS DO NOT PAY

WARNING!

"Why Sow Rubbish?" an article giving a brief account of experience obtained from three experimental plots in which areas sown with certified pasture seeds were laid down alongside areas sown with cheap seed, appeared in the "Journal of Agriculture" for February, 1942.

These same trials were visited in June of this year, three years after they were laid down, and the results are so striking that it is felt that they would be of interest to all who contemplate sowing down pasture.

— By —
A. V. ALLO,
Instructor in Agriculture,
Thames.

SO much has been said and written about the necessity for using high-quality seeds that one would be apt to think that the lesson has by now been driven home. Nevertheless, one can still read advertisements in the Press offering lines of cheap seed, while one still meets farmers who are using such seed when sowing down new pastures. It is thus considered that, even at the risk of repetition, a further warning against the use of cheap seed in pasture establishment is justified.

Tempting, but Uneconomic

It must be admitted that to the farmer who is not too well off financially the price of 4d to 6d per pound is very tempting. Human nature is such that anything cheap is attractive and the cheap seed merchant, in taking advantage of this weakness, has caused many farmers serious financial loss. At the same time the use of such seed has meant a serious loss of production on much of the lands sown with this class of seed. At a time when we are being asked to produce to a maximum it is obvious that this practice would nullify much of the labour and money spent by a farmer in an endeavour to respond to the call for increased production.

The farmer who is often tempted to use such seed is usually the very man who can least afford to do so. As mentioned above, a man with limited finance finds the low price of such seed very attractive and is inclined, often against his better judgment, to risk it in the hope that he may be fortunate enough to obtain a decent sample of seed. He rarely does so, for such seed seldom, if ever, gives a really satisfactory sward, and he ends up with a poor pasture that does not produce anywhere near sufficient feed to fill his requirements. His returns are, therefore, lower than they would have been had good seed been used, while in these times of fertiliser shortage it is well-nigh impossible to improve such a sward by topdressing and good management.

Weed Seed Present

A further point to remember is that cheap seed mixtures nearly always contain a goodly proportion of weed seed. The farmer using such seed is risking introducing many new weeds into his country.

In the three trials under review, laid down in the autumn of 1941, the writer purchased a line of cheap seed on the open market from a firm which extensively advertises such seed. The analysis of this seed was as follows:—

	Pure Seed. Per cent.	Germination. Per cent.
Perennial ryegrass	63.6	64
Red clover ..	10.9	46
White clover ..	8.3	20 + 33% hard seed
Italian ryegrass	4.5	60
Timothy	2.6	90
Cockstoot ..	2.2	50
Crested dogstail ..	1.6	27
Browntop ..	1.0	57
Suckling clover ..	1.5	31 + 60% hard seed
Also trace of lucerne and yarrow.		
Weed seeds (ribgrass, hairgrass, soft brome, and sweet vernal) ..	1.1	
Straw, chaff, etc.	1.7	

In his report on the seed sample the seed analyst advised that the ryegrass was of a poor temporary type and the white clover of a fair type.

Trials Laid Down

Each trial consisted of three plots. Plot A was sown with a standard mixture of certified seed sown at the rate of 40lb per acre; Plot B with 40lb per acre of the above cheap seed mixture, and Plot C with 20lb per acre of the same mixture as Plot A.

Conditions were very good at the time the plots were laid down, and all three plots struck well in each trial. At the end of nine months Plot A had rapidly developed a dense ryegrass-

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white clover sward of a really good type. Plot C, with half the seeding given to Plot A, was much thinner, demonstrating the necessity of using an adequate seeding. Plot B, the cheap seed plot, was markedly inferior to the other two. Ryegrass was weak and spindly and yellowish in colour, clovers sparse, and bare ground and weeds plentiful.

Three Years Later

Let us now consider the picture three years later. On every trial the certified seed plot sown at 40lb per acre (Plot A) has given a really good high-producing sward. Ryegrass, cocksfoot, and white clover are well balanced and thriving, and one would have no hesitation in pointing out this plot as an ideal dairying pasture. Plot C (half in seeding rate of certified seed) also shows up well in each trial, although the sward is still rather too open for a first-class pasture. These plots demonstrate clearly the necessity for sowing sufficient seed to give an adequate covering of the ground. Alongside these plots the cheap seed plot presents in every case a dismal appearance. The sward is thin and open, with many weeds. Suckling clover is the dominant pasture species, with ryegrass and white clover almost completely absent. The contrast between cheap and certified seed is really striking.

Cannot be Built Up

One of the arguments brought forward by those who advocate the use of cheap seed is that pastures sown with such seed can soon be built up with proper management and top-dressing. In one of the trials discussed above the farmer has liberally manured the area each year since the trial was laid down, while his management has been particularly good. In spite of this, the cheap seed plot is still a blot on an otherwise excellent paddock.

You can't make a silk purse out of a sow's ear, nor can one develop economically a productive sward unless the foundation of an adequate sowing of good quality seed is there. Remember always that the only one who makes a profit out of cheap seed is the man who sells it.

The problem during certain seasons of the year of the provision of suitable succulent green leafage for stock is competently treated in "Cereals for Greenfeed," Bulletin No. 208, which is available free from offices of the Department of Agriculture. The sowing, recommended seed varieties, and utilisation of oats, maize, barley, wheat, ryecorn, millet, and sorghum are discussed in a way which cannot fail to be of interest to the farmer who places due value on green feeds.

THE POTATO CROP OF NEW ZEALAND 1769-1944

— By —
J. H. CLARIDGE,
Seed Certification Officer,
Wellington.

THE common potato of commerce *(Solanum tuberosum)* is generally recognised as having originated in South America, though its exact origin is in doubt. There is doubt also in regard to the date of its introduction to Europe, though the year 1580 is usually quoted in this respect. Thus the potato has only in relatively recent times figured as an article of diet for the civilised world, but it rapidly became one of the mainstays of human foodstuffs.

IT was probably introduced into New Zealand by De Surville in 1769, by Marion in 1772, and by Captain Cook on his second voyage in 1773. The Maoris apparently had little difficulty in adapting themselves to the growing of this crop, and it would seem that from one or other of these introductions potato growing spread, particularly in the North Island.

Maoris' Success

Dr. Savage, who visited the Bay of Islands in 1805, referred to the potato in the following terms:—

> "This (cultivation) it is true is confined to the growth of one vegetable, but in which they are remarkably successful. I allude to potatoes; and indeed I never met with that root of a better quality; they kept remarkably well, and we provided a stock of them sufficient to supply the whole ship's company for several months. . . . I could not learn when they first became possessed of this invaluable root. . . . I believe they usually have two crops in the year, and I have not heard that they fail from accidental causes."

There is no clear picture of the development of potato growing in New Zealand through the balance of the century, but at its close the annual acreage had reached the not inconsiderable total of about 38,000 acres, with an average yield of 6 to 7 tons per acre. Even allowing for some inaccuracies in the compilation of these figures, by present-day standards the potato crop was indeed a large one. The official figures of the year 1899, namely, 38,604 acres, 298,561 tons of produce, an average yield of 7.7 tons per acre, and an export of 25,396 tons, have in no instance been exceeded to the present time.

Since the opening of the present century there has been a steady downward trend in the acreage of potatoes grown, relieved only by a temporary uplift during the period 1925 to 1935, followed by a much more rapid drop in 1941 to 1942.

Reduced Consumption

The net result has been a reduction in the acreage of 40 years ago by almost 50 per cent. This reduction, combined with the increased population over the same period, indicates that the consumption of potatoes per head of population is now approximately one-fourth of what it was about the year 1900. At present rates of consumption it is estimated that 80,000 tons of table potatoes or 114,000 tons of total crop (the produce of 20,000 acres) are required to be grown commercially, in addition to what might be grown in private gardens, in order that New Zealand's requirements might be met.

Potatoes are grown in New Zealand essentially for local consumption, the only regular export being a quantity of somewhat less than a thousand tons shipped to various South Pacific islands each year.

When periods of over-production have coincided with periods of under-production in Australia a considerable export trade has been possible. Instances of these occurred in the periods

1898 to 1902 inclusive, 1912, 1915, and 1926, when over 15,000 tons were exported in each year, while in 1937 a similar quantity was shipped to South America. In general, however, the export market cannot be relied upon to dispose of any crop surplus, and in a similar way overseas sources cannot provide a dependable supply should local production not be sufficient to meet requirements.

Variable Crop

In addition to fluctuations in acreage already referred to, the potato crop is one of the most variable in regard to the yield per acre, Dominion averages as low as 4¾ tons and as high as 7 tons having been experienced in the last decade.

Thus it is found that the history of potato growing in New Zealand is punctuated with seasons of surplus potatoes when returns to growers have hardly paid harvesting costs, intermingled with seasons when potatoes have brought almost fabulous prices and growers have had virtually nothing to sell. Fluctuations in either direction, it would seem, react to the detriment of the grower.

The position is exaggerated by the perishable nature of the crop and the fact that there has been no outlet other than as stock food for surplus produce. The development of industries to absorb surpluses has not proved successful in the past, as these industries have themselves wished to be assured of a regular supply of raw material, thus exaggerating rather than alleviating the problem of fluctuations in production. Even as a stock food farmers have not been interested at other than extremely low prices.

The extent of this variation in total yield of crop is shown in the figures for the ten years immediately prior to the war, on three occasions during which period the yield varied from the estimated total crop requirement of 114,000 tons by over 20 per cent.

Year.	Total Crop. Tons.	Year.	Total Crop. Tons.
1930	130,107	1935	109,123
1931	151,525	1936	121,004
1932	116,743	1937	126,314
1933	129,079	1938	146,785
1934	131,045	1939	87,671

Thus 1931 was a season of over-production unrelieved by any export of the surplus crop. The relatively small surplus of 1937 was entirely absorbed by export to South America, but the export market did nothing to relieve the glut of potatoes in the following season. In 1939, on the other hand, a short crop resulted in a relative famine in potatoes, a position which was eased only slightly by the importation of supplies from North America in the latter part of the year.

Stabilising Efforts

From the aspect of the producer anything which can be done to even out his returns, either by a more regular acreage grown each year or by a price which will not fluctuate to such extremes according to the potatoes available, should be to his advantage.

In an endeavour to increase potato production during the war period in order to meet war requirements the Government has instituted a system of contract growing at guaranteed prices. The results of this move will be watched with interest by all those connected with the growing and distribution of potatoes in view of its providing a possible solution to the inconsistent and upsetting, if not disastrous, methods of growing and marketing adopted in the past.

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LIQUID MANURE
Tonic for Poor Pastures

By P. S. SYME,
Instructor in Agriculture,
Warkworth

Striking evidence of the value of animal manure.

Since attention was first drawn to the potential value of cowshed washings by Mr. A. G. Elliott in 1939, and the methods, as pioneered by Taranaki farmers, were later described in a series of articles by Mr. G. A. Blake in 1941, the use of liquid manure for topdressing has been gradually spreading to other dairying districts. The fact that increasing numbers of farmers are now turning to good account shed washings which formerly were either neglected or very wastefully used is ample evidence that the practice is being found well worth while.

THAT animal manure is unrivalled by any other fertiliser available is well demonstrated by the vigorous grass growth surrounding old cow droppings. It is also commonly noted that on many very poor swards the only ryegrass present may be found beside decomposed droppings, and this affords additional proof, if any were needed, of the unique value of farmyard manure in improving a poor pasture.

It is noteworthy that while many farmers will go to considerable trouble to spread and utilise cow droppings in the field, they often make little effort to use what falls in the shed. Yet both are equally valuable. It is largely a question of economics.

Analysis Not Everything

Experimental evidence suggests that over the year the shed droppings available from a herd of 50 cows would be approximately equivalent to 10cwt. sulphate of ammonia, 10cwt. potash salts, 4cwt. superphosphate, and 4cwt. of lime, and would be worth about £18. Considering that the acreage of land in New Zealand which is deficient in potash is relatively small, and that nitrogen can be supplied by the clovers free of cost, it must be conceded that these figures do not make an impressive showing—on paper. However, the impartial observer will readily admit that, judged by practical test in the field, the response from an application of liquid manure can indeed be spectacular, and there is growing evidence that the figures of analysis may tell only a minor part of the story. Indeed, it has been claimed that the value of animal manure in promoting mycorrhizal associations and its ability to provide the plant with essential substances somewhat comparable to the vitamins which plants supply to animals may far outweigh the fertilising value of the inorganic constituents as assessed by analysis.

Profit Margin Small

While shed droppings should be utilised wherever practicable, the margin for profit when installation and distributing costs are considered must obviously be small. Enthusiasm should not be allowed to override common sense, and the prudent farmer should first consider whether the use of liquid manure is economically practicable on his farm, having regard to considerations such as the amount available, the topography of the farm, the cost of installation, and the labour involved in distribution.

Designing the Layout

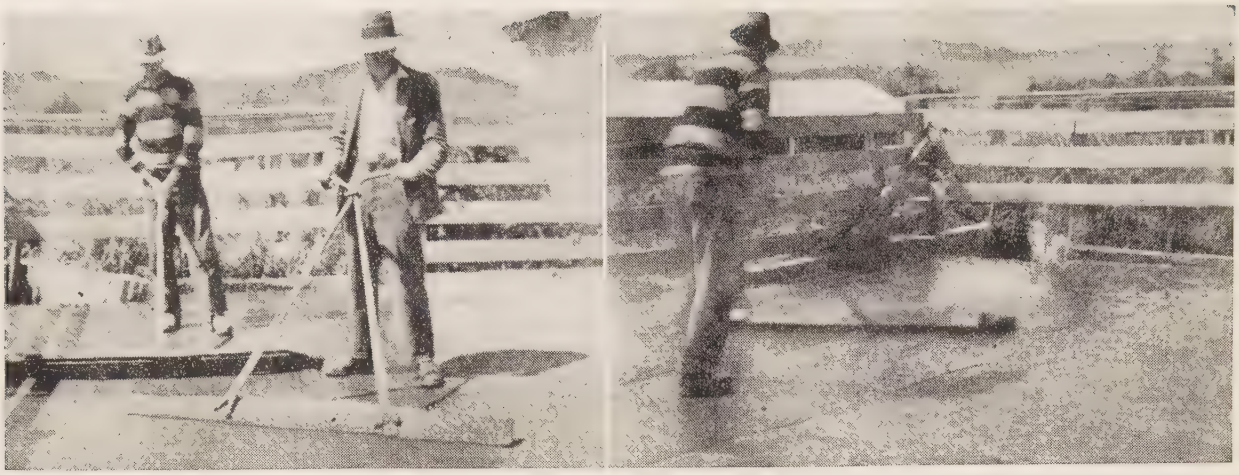
If the scheme appears sound, consideration might then be given to deciding the most convenient layout. If the shed is on high ground, it may be possible to use gravity and save on pumping apparatus, an important factor from the viewpoint of installation costs. Again, it may be convenient to wash the sweepings direct into the distributor and so save the cost of a collecting tank. Much has been said regarding the value of a collecting tank in permitting time for a "ripening" process, but, judging from the excellent results obtained by direct application, it is exceedingly doubtful whether the "ripening" is of any importance whatever. There can be no doubt, however, that from the view of convenience and the economical use of labour a large storage reservoir has much to recommend it. Although a very elaborate design involving heavy capital expenditure is likely to be unwarranted, it is generally agreed that any facilities tending to make the distribution less laborious or less irksome are worth careful consideration. In this connection emphasis is commonly laid on ample storage capacity and a speedy type of distributor, motorised for preference.

Farmer's Experience

While any farmer who is interested in the use of liquid manure can probably now obtain first-hand information in his own district, the experience of a Northland farmer, Mr. R. McKay, Taipuha, may still prove of general interest.

Mr. McKay's farm comprises an area of 300 acres, all flat or gently undulating. The land is for the most part poor gumland of very low natural fertility, and much of it has only recently been brought into grass. Although the farm now carries some excellent pastures, portions of it have responded very slowly to artificial fertilisers and there has been a tendency to revert to browntop.

Before making up his mind to install a liquid manure outfit Mr. McKay decided first to try out shed sweepings on a small scale, using a tank mounted on a sledge. A very short experience convinced him that though the results left nothing to be desired, the method left plenty of room for improvement. Accordingly, when he eventually decided to go the whole way, he determined that the distribution must not interfere with the work of the farm, and that it must be convenient and speedy. With this end in view he paid special attention to constructing a large-capacity tank which could be emptied at any convenient opportunity over a period of about 6 weeks in the flush of the season. Distribution, he considered, could best be performed by



Left: Types of scraper. One is made from an old saw and the other from a discarded tyre. *Right:* View of sump inlet. Note the raised concrete edging and the wide entrance.

Left: The storage tank, which holds nearly 8000 gallons—equivalent to a six weeks' supply from a herd of 80 cows. *Right:* Filling the distributor. The 4in. outlet pipe fills the distributor tank in a few minutes.

Left: View of distributor showing type of spreader used. Note the reflecting mirrors which indicate when the tank has emptied. *Right:* The machine in use. The spreader distributes the liquid very evenly over a width of about 6ft.

a motorised outfit capable of quickly treating even the most distant fields. How well he has succeeded with the project may be judged by the following brief description:—

Layout of Plant

As will be seen from the illustration the cowshed floor and yard slope down towards the sump inlet. This inlet has been made of generous size, so that shed washings are easily swept in and carried off by gravity through a 6in. glazed underground pipeline. Provision is here made for diverting rainwater, or cleaning water which is too diluted to be worth carting. On its way to the collecting tank the pipeline runs through the calf bails, where it receives a useful contribution before passing to the collecting tank. As already mentioned the collecting tank is of large capacity. On the assumption that a ripening period might be of value the tank is divided into two sections, the over-all dimensions being 19ft. x 19ft. x 3½ft. and providing a holding capacity approaching 8000 gallons. The liquid from this tank flows by gravity into the distributor through a 6in. delivery pipe, so that no time is wasted in filling.

The distributing tank holds 250 gallons and was constructed from an old steam boiler which was picked up at a nominal price. The plating is very strong and promises to be everlasting. As will be seen from the illustration, the boiler was cut down lengthways and part of the cut-away plating used to provide a deck covering. After trial it was found advisable to fit a special delivery cock which would open to the full bore of the pipe to prevent blocking.

Cost Within Bounds

Although the entire plant is highly efficient and was built to last, Mr. McKay performed the work himself and the costs have been carefully kept within bounds. The actual out-of-pocket expenses were approximately as follows:—

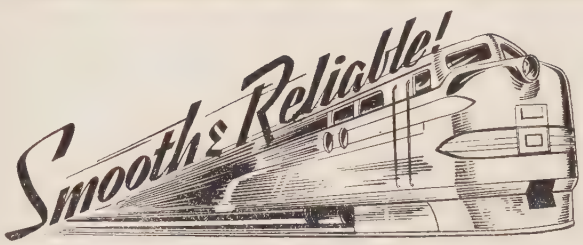
	£ s. d.	£ s. d.
Cost of holding tank: 3½ tons cement	17 10 0	
12 Yards Shingle (on farm)	3 0 0	
2 Yards Sand	3 0 0	
2 cwt. Reinforcing Iron	3 10 0	
		27 0 0
Distributor:		
Motor Truck .. .. say	20 0 0	
Tank (converted)	12 10 0	
Special full-bore Tap	5 0 0	
		37 10 0
Underground Pipeline:		
150ft. glazed 6in. pipe	15 0 0	
		15 0 0
Approximate total cost		£79 10 0

Thanks to his insistence on speed and convenience, Mr. McKay is able to distribute about 5000 gallons of liquid manure in a single day. With a herd of about 80 cows the quantity of washings amounts to about 180 gallons per day, so that the tank need be emptied only when convenient over a period of about six weeks.

The rate of application depends to some extent on the type of pasture being treated, and it has yet to be determined what will be the optimum rate, and whether it is better to treat a large area lightly or a smaller area correspondingly more heavily.

Used as a Tonic

In the past two years Mr. McKay has made it a practice to conserve the liquid manure for those portions of the farm which are poorest and most likely to benefit. He has found that a single application of about 2000 gallons per acre can speedily bring about a marked improvement in the sward, and this he attributes partly to the manure and partly to the numerous clover seeds present in the washings. The way in which ryegrass and white clover have come in following treatment on areas which had given little response to artificial fertilisers has been quite astonishingly rapid, and it appears that the judicious application of liquid manure will eventually even up the quality of the pastures over the farm more quickly and economically than any other means. With the relatively light applications used stock



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● Smooth, fast and reliable, the modern streamlined train is the last word in rail transportation. In the field of milking machines, L.K.G. holds the same foremost position—the smoothest, fastest, most dependable of milkers! Engineered to the finest limits the L.K.G. milks fast and clean — so clean is fact that stripping is hardly necessary, even in autumn. L.K.G. also eliminates starting and propping troubles—and its action is so near to Nature's that udder troubles are reduced to a minimum. All the facts about L.K.G. Milkers are worth having.

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have never at any time shown reluctance to graze treated pastures when once the herbage has been washed by a few showers.

Results Uniformly Good

Excellent results have been obtained at all periods of the year, but the benefits have been most marked in the winter period when normal growth is slowest. It is evident that the response obtained is no mere flash in the pan, and no written records are needed to indicate the fields treated. Indeed the improvement persists over a surprisingly long period and is still noticeable more than a year after the time of application.

After two years' experience with the use of liquid manure Mr. McKay is entirely satisfied with the results obtained. The benefits do not extend only to the pastures, however, for the problem of the disposal of the malodorous shed refuse is also satisfactorily solved. Making no extravagant claims on behalf of liquid manure as a fertiliser, Mr. McKay is content to let the pastures speak for themselves. They are more eloquent than he.

Radio Broadcasts

RADIO talks to farmers will be given from Station 1YA, Auckland, at 7.15 p.m. on the following dates:—

September 4—"Field Work for the Coming Month," by Mr. P. S. Syme, Instructor in Agriculture, Department of Agriculture, Warkworth.

September 11—"Milk Fever," by Mr. H. W. Carbury, veterinarian, Department of Agriculture, Auckland.

September 18—"Pests and Diseases of Tomatoes and Potatoes," by Mr. R. M. Brien, mycologist, Plant Diseases Division, Auckland.

September 25—"Young Farmers' Clubs Session," to be arranged by the Eastern Bay of Plenty District Y.F.C. Committee.

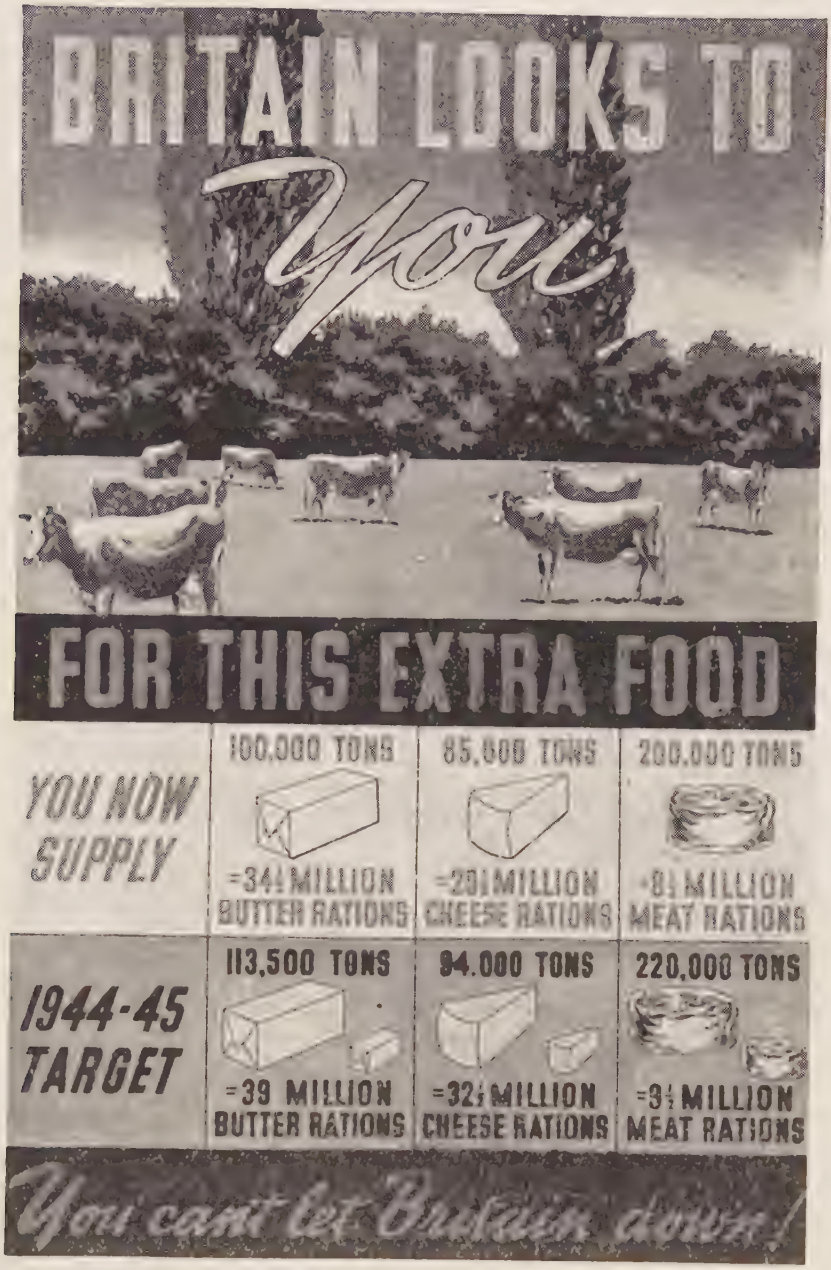
WAGES FOR DAIRY FARM WORKERS

MINIMUM wages to be paid to workers on dairy farms from August 1, 1944, are fixed in the Agricultural Workers' Wage Fixation Order, 1944, which was recently gazetted. The attention of farmers is drawn to the rates printed below, which are in force until July 31, 1945, and thereafter until a fresh order is made.

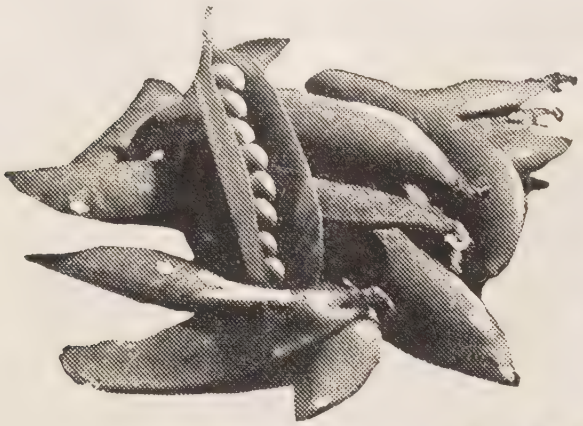
	£ s. d.
Under 17 years of age	1 11 9
17 and under 18 years of age ..	2 0 9
18 and under 19 years of age ..	2 9 9
19 and under 20 years of age ..	2 19 6
20 and under 21 years of age ..	3 8 6
21 years of age and over	3 17 6

An additional £1 a week must be paid where keep is not provided.

YOUR JOB FOR 1944-45



EXTRA **OUNCES** OF EFFORT WILL WEIGH **POUNDS** FOR VICTORY



Contract Growers Wanted for SEED PEAS

Arthur Yates & Co. Ltd. have again been entrusted to supply a large proportion of the requirements of Australia and England (also New Zealand's needs) in Seed Peas. Civilians and Fighters in overseas Allied countries call for more and more of this important protein food—they need peas for sowing, canning and dried.

Consider now, before it's too late, can you reserve an area for Spring sowing or increase that block you have already promised?

Contract grow with security with New Zealand's leading Seed Growers —Contract prices up to 15/- per bushel. Seed supplied at contract price—Freight paid on produce from grower's station. Payment made promptly on full weights — no dressing charges — no deduction for dressing loss on average dry sample.

BEAN SEED CONTRACT GROWERS also wanted in North Island, Marlborough and Nelson. Beans 20/- per bushel.

Get in touch NOW with District Agent—

POVERTY BAY: Common Shelton & Co., Gisborne.
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MARLBOROUGH: A. Yates & Co. Ltd., Branch Office, Blenheim.
NELSON: Dalgety & Co. Ltd., Nelson.
CANTERBURY: Alex McDonald & Co., Cashel St., Christchurch.
OTAGO CENTRAL: C. E. Wallington, Omakau. (Phone 6K).
WAKATIPU & SOUTHLAND: D. W. Thompson, Box 91, Queenstown. (Phone 42M).

Arthur Yates & Co. Ltd.

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Turnip and Swede Seed

CARE NECESSARY WHEN BUYING

The composition of the crop referred to in the article.

There is always a risk in purchasing seed without some guarantee of strain. This holds true for any crop which a farmer may wish to sow, but it is very well exemplified in the case of a line of locally-grown "turnip" seed which was recently on the market.

THE producing crop had received no particular care or attention to safeguard its purity, but was a feed crop which had, very truly, "been let go for seed."

Analysis

The produce of the area was marketed as "early turnip seed — suitable for lamb fattening." The analysis of a crop grown from this seed revealed that it was comprised of

	Per cent.
Yellow-fleshed greentop turnips	40
Yellow-fleshed purpletop turnips	25
White-fleshed greentop turnips ..	5
Rape	15
Hybrid plants (the result of cross-pollination of rape and turnips)	15

A hybrid plant—the result of cross-pollination between rape and turnip.

Some farmers certainly do mix different varieties of turnips, and even turnips and rape, for feeding purposes, but they prefer to make their own mixtures in proportions to suit themselves rather than to have the seed "ready mixed" as in the above instance. Further, to obtain only 5 per cent. of an early variety of turnip in seed described as "early" and at the same time to discover the presence of 15 per cent. of plants similar to that in the illustration is hardly one's idea of a "ready-made mixture."

The insurance against such a result in a crop should of course be obvious. It is to purchase only "Government Approved" seed.

—J. H. CLARIDGE,
Seed Certification Officer, Wellington.

Pig Industry Broadcasts

UNDER the auspices of District Pig Councils broadcasts will be delivered in September as follows:—

Auckland—1YA, on September 20, at 7.15 p.m., "Avoiding Losses in Pig Production," by F. Barwell, Supervisor, Bay of Plenty District Pig Council.

Wellington—2YA, on September 17, at 7.20 p.m., "Whey Feeding," by C. H. M. Sorensen, Supervisor, Taranaki District Pig Council.

Christchurch — 3YA, on September 21, at 7.15 p.m., "Housing," by Hector McIntosh, Supervisor, Canterbury District Pig Council.

Napier—2YH, on September 14, at 7.30 p.m., "Avoiding Losses," by I. H. Owtram, Supervisor, Tairawhiti District Pig Council.

Units of measurement may be converted by the following simple table:

Ins. to cms.	Multiply by	2.540
Yds. to metres	„	.900
Miles to kilometres	„	1.600
Sq. ins. to sq. cms.	„	6.450
Cub. ins. to cub. cms.	„	16.400
Grains to grams	„	.065
Lb. to kilograms	„	.450
Cub. ft. to cub. metres	„	.030
Cub. yds. to cub. metres	„	.760
Cms. to ins.	„	.400
Metres to yds.	„	1.100
Kilometres to miles	„	.620
Sq. cms. to sq. ins.	„	.155
Cub. cms. to cub. ins.	„	.060
Grams to grains	„	15.400
Kilograms to lb.	„	2.200
Cub. metres to cub. ft.	„	35.300
Cub. metres to cub. yds.	„	1.310

LESS THAN HALF THE COST—

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DAIRY FARMERS!

For WHITE and BLOOD SCOURS use . . .

"MAX" SCOUR MIXTURE

Prevent your calves from contracting white and blood scours by adding a quarter of the regular dose per head of "Max" periodically with the milk—it's proved itself and is really good. "Max" contains tonic properties as well as curative. Dose your calves regularly and this distressing complaint will be nipped in the bud. But, if you've not taken this precaution, immediately you find your calves affected, dose them with "Max," and you'll still save your stock

PRICES:

8 oz., 7/6 (plus Postage 1/6)
16 oz., 12/6 (plus Postage 1/6)
30 oz., 19/ (plus Postage 1/9)

OBTAINABLE:

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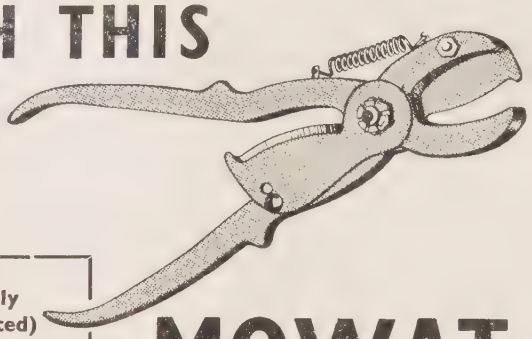
DOCK YOUR DOCKING LOSSES WITH THIS



Tailer only
(as illustrated)

£3

Combined Castrator
and Tailer

£4

MOWAT INSTRUMENT

You can save those valuable lambs this coming docking seasons by using the "100 per cent. efficient" "MOWAT" instrument. For many seasons now farmers have prevented loss entirely, and have done the job quicker . . . better . . . safer ! The "Mowat" tailer and combined castrator and tailer are scientifically designed for scientific docking. Make sure of yours early.

FARMERS throughout New Zealand acclaim the "Mowat" as the perfectly satisfactory instrument.

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South Island :
ANDREWS & BEAVEN LTD. Christchurch, Ashburton, Timaru, Invercargill and West Coast.

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Phenzeen

The Special Purpose Phenothiazine Drench

Farmers everywhere who try Phenzeen are coming back for more. Phenzeen can be used for all kinds of stock equally effectively—sheep, cattle, pigs, horses and poultry. And it will eradicate more types of worms in one dose than any other type of drug or worm drench.

For sheep drenching, use only for special purposes, such as stud sheep, etc. For economical "general flock drenching," use Giesen's and Sutton's drenches.

Available both in 1 lb. tins and the even more economical 6 lb. size.

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SHORTAGE RELIEVED

Sheep Drenching Instruments

Primary Producers for two years have been handicapped on account of insufficient supplies of Sheep Drenching Instruments. The news that persistent efforts to obtain supplies have at last been rewarded will be welcomed by sheepfarmers. Limited supplies of the famous Elliotts Automatic Drenching Guns and Pistol Drenchers have already arrived, and during the next few months supplies will come more freely to hand, and should be sufficient to meet long-standing needs.

The Elliott Pistol Drencher, when supplied with a special Phenzeen Nozzle, is the only drenching instrument suitable for administering Phenothiazine Drench.

There is also the welcome news of the arrival of supplies of Elliott's new 10 C.C. Vaccinating and Drenching Syringes. These dual purpose instruments will prove very popular indeed and are priced very moderately. Farmers are urged to send in their requirements at once so that the supplies, when they arrive, can be allocated and orders more quickly met.

Full details of any, or all, of these instruments will be supplied on request without obligation. Enquiries and forward orders should go through stock firms or direct to the

N.Z. Representatives
Premier Products Ltd.,
Huddart Parker Bldg., Wellington.

★ ★ ★ FOR ALL GENERAL FLOCK DRENCHING

Giesens

Carbon Tetrachloride Drench provides reliable low-cost control of Stomach, Bloodsucking, Intestinal Worms and Liver Fluke, and can be used alternately with

Suttons

Nicotine Bluestone Cobalt Drench, which effectively treats infestation with Intestinal Worms and Tapeworms.

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Veterinary Notes for the Farmer

Effect of Labour Shortage on Stock Health

Manpower requirements for the Armed Forces during recent years have made a severe drain on farm labour, a factor which may prove responsible for a higher incidence of many diseases and ailments affecting livestock, especially dairy stock, as there is a tendency for some farmers, through force of circumstances, to become careless regarding their methods of stock management.

FOR instance, the writer has found on several farms where labour is short a marked increase in the incidence of mammitis in dairy herds. Labour difficulty is probably in many cases the main factor responsible for the spread of this trouble, as farmers contend that they have not the time to bother with suspected cases. Sheds are severely under-staffed in many instances, and consequently affected cows are not given proper attention but are milked indiscriminately along with apparently sound cows. Milking machines are often left on cows for unnecessarily long periods, a practice which is to be condemned where mammitis is likely to exist in a herd. Unless every attention is given to all proper precautionary measures, under present conditions, mammitis may be responsible for an increased drop in production and perhaps the ruination of many good dairy herds.

Temporary sterility, or failure of cows to hold to the bull, is a condition which is troublesome to farmers, but which is not always due to septic infection. Some farmers who in the past have kept their bull confined and have taken the cows to him as they come in season now find it a saving of labour and time to have the bull running with the herd. This is an inadvisable practice for many reasons. Many cows continue to return to the bull, the farmer coming to the conclusion that septic infection is the cause, and it is also difficult to keep a reliable check on calving dates. Furthermore, if there happens to be a cow in the herd which develops an infection, a discharge frequently goes unnoticed until after damage is done and the bull has carried infection to other cows in the herd.

At Calving Time

During the past season a number of aborted calves have been left about paddocks. Here the same cry has been raised in some cases. The farmer is short-handed and hasn't time to bury or otherwise dispose of dead calves and cleansings, so they are left as a source of infection to the remainder of in-calf cows. If a hospital paddock was provided as near the milking-shed as possible a lot of time and no doubt a lot of trouble could be saved by bringing into this paddock any springing cows which are close up or animals threatening to slip, and so keep all likely infection in one spot. This would also eliminate the necessity of having to drive cows and calves long distances to the milking shed, a job which often takes up quite a bit of time.

There is another so-called labour and time saving practice which has recently developed on some farms and which cannot be well recommended. The majority of dairy farms today possess a set of calf-bails where the calves are fed in separate buckets. Some farmers, it has been noticed, have discarded this practice recently in favour of feeding the calves en masse from troughs, which are more often than not left from milking to milking without being properly washed and scalded. This method of feeding is conducive to many digestive ailments in young calves, such as scours and acute indigestion. Apart from the more unsanitary conditions obtained from this method of feeding, there is a tendency for the older and more robust calves to overgorge themselves, often with disastrous results.

Priority to Stock Health

While it is realised that farmers today are carrying on under difficult conditions, it seems a great pity if we are to allow the present unavoidable labour shortage to have a decreasing influence on the health of our livestock. Surely the management of the dairy herd, on which the primary production of this country depends so much, should be given preference over all other farm operations. To this end it would appear more advisable for farmers to spend as much time as is required with their stock, and, if necessary, pay less attention to other routine work or improvements to their properties until such time as the labour problem improves.

—W. J. COOPER, Inspector of Stock, Auckland.

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It gives Bloodless Castration by scientific and humane methods.
Reduces losses to a minimum.
Gives Earlier Returns and Greater Profits.
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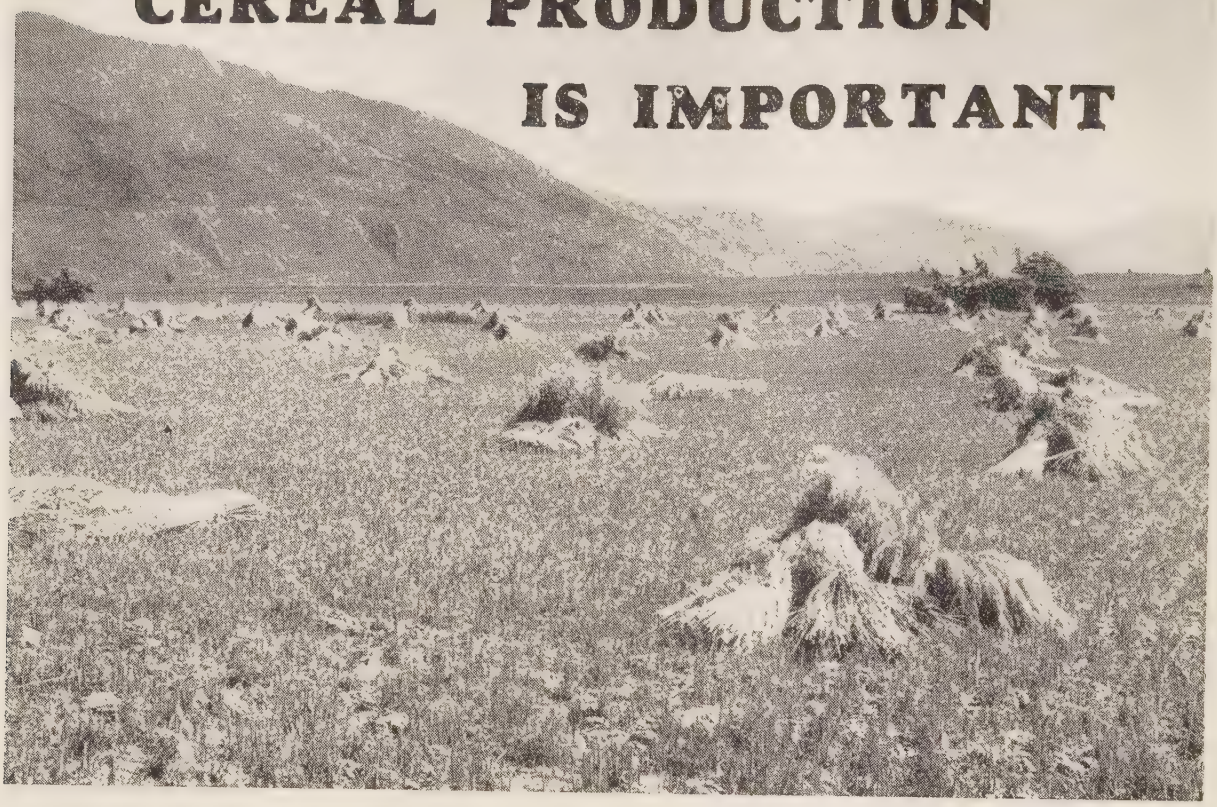
CEREAL PRODUCTION IS IMPORTANT



TARGET ACREAGES FOR 1944-45

WHEAT - - - - - -	300,000
MALTING BARLEY - - -	38,000
FEED BARLEY - - - -	40,000
MAIZE - - - - - -	10,000

Every endeavour should be made to extend spring sowings so that targets are reached.

Spring-Sown Cereals

Now that spring is coming farmers may resume their sowings of cereals so that the target objectives outlined for each crop will be reached. This calls for effort particularly from farmers on those soils and in those districts most suited to spring sowing.

Wheat

Three hundred thousand acres of wheat are required to be planted this year. Farmers nearly reached this objective in 1942-43 when they grew 287,000 acres. Each farmer should therefore try to improve on his programme for that year and those farmers with land and facilities for growing wheat who grew little or no wheat in that year should endeavour to grow some this year.

The wet weather that has prevailed in the late autumn and early winter months over most of Canterbury and Otago and in the North Island has resulted in light autumn and winter sowings, particularly on the heavy soils. In Canterbury on such soils spring sowings of wheat are generally successful as long as sowing can take place in August or early September. In the moister districts of Otago, in Southland, and in the North Island spring sowings of wheat are commonly practised and are generally more successful than those made in the autumn. Sowings in most of these areas up to October are generally productive of good crops, but the attempt should be made to sow this month if soil conditions permit.

In the North Island the Tainui variety is recommended, except on the heaviest land in the wetter districts where Cross 7 is more suitable.

Barley

Thirty-eight thousand acres of malting barley are required as against 30,000 grown last year. Barley for malting is grown in recognised malting barley districts in the South Island, and each grower of barley is therefore required to increase his acreage by about 25 per cent.

In addition, 40,000 acres of feed barley are needed, mainly for feeding pigs, and therefore most of this should be grown in the North Island as close to the pig farms as possible to save transport.

Barley will not stand wet and cold conditions, and generally, except on light soils in dry climates, is spring sown. For malting the two-rowed recognised malting varieties should be sown. For production of feed barley in the North Island sow Cape or Black Skinless barley. The sowing should be at the rate of about 1½ bushels per acre in the South Island and 2 bushels per acre in the North Island, and for malting barley, in particular, careful attention should be paid to even drilling of the seed.

Oats

Oat production should be maintained so that further importations of seed oats are not necessary. Oats for threshing have shown a serious decline in recent seasons as follows:—

Season.	Area in Oats for Threshing.
1940-41	71,700 acres
1941-42	70,800 ,,
1942-43	56,300 ,,
1943-44	48,400 ,,

In the North Island farmers should make an effort to satisfy at least their own chaff requirements. Every year many tons of oat sheaf chaff are brought to the North Island from the South Island. The crop can be readily grown and harvested in the North Island and every ton grown there means a reduction in the strain on our internal transport system so evident at the present time. North Island farmers wherever possible should also grow oats for threshing to satisfy horse feed requirements and to provide seed for sowing greenfeed crops next autumn. For all purposes Algerian oats should be sown in the North Island, August being the best month for sowing and the seeding 3 bushels per acre.

In the South Island spring-sown oats should be confined to the moister districts of Otago and Southland. Here rust is not prevalent and Gartons Abundance is the popular variety on account of its high yield and the quality of the grain which is suitable for milling. The millers have been busy to an increasing extent in providing oatmeal, not only for domestic consumption but also for export overseas. The surplus over and above milling requirements is used for feeding

Add CODLIVINE to

replace butterfat values and build healthy CALVES

Codlivine, made from purest Codliver Oil, is highly palatable. Calves grow big on regular feeding of this concentrated vitamin food. It helps resist disease . . . builds constitution . . . aids digestion. Each 100 lbs. contains 2,000 feeds . . . costing you less than one-fifth of a penny per feed.

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horses and to provide seed for next year's crops. Oatsheaf chaff is also needed to feed horses and to an increasing extent to supplement winter fodder crops for sheep.

Maize

In the maize grain growing areas over 10,000 acres of maize for threshing will be required, as against 7251 acres grown in those districts in 1942-43. This means an increase of over a third in the area and calls for great effort on the part of the maize growers to keep this country self-supporting in this important product. Maize is in short supply on the world's market, no doubt due partly to shortage of shipping space, and if we are to increase our production of eggs and pig meats it will be necessary for the poultry and pig farmers with suitable soil and climatic conditions to grow some of their own requirements and not rely entirely on the maize grower. Maize requires a moist, warm climate with no severe frosts from October till April. The seed is sown at about 14 lb. per acre in drills about 30 in. apart with 12 in. spacings, but sometimes it is grown on the square with 30 in. spacings. Until the plants are a foot or so high the land may be harrowed to destroy weeds, the grower picking the hottest part of the day for this practice so that the least damage is done. After that very shallow intercultivation is necessary till the plants have grown to an extent to prevent further cultivation.

Preparing for Hay and Silage Making

PLANS should now be made for the closing of fields when spring growth commences. Decisions not only have to be made concerning which fields should be closed, but also the order of closing. For silage fields should be chosen from those which make early growth and will be ready for cutting well before weather conditions are suitable for hay making. Thus fields for silage should contain a high proportion of early grasses and clovers such as ryegrass or subterranean clover. These fields should be shut up from stock in September in the earlier districts or as soon as spring growth commences.

The fields for hay should be closed a fortnight or a month later than the silage fields, dependent on the local climatic conditions and the type of pasture. Thus fields for hay should be closed at a time when a good leafy growth of grass and clover will be produced ready for harvesting at a period when reasonably good weather conditions can be expected. Therefore in districts where harvesting weather is not normally experienced till January fields should not be closed until October. In other districts, unless a late grass such as cocksfoot or paspalum is present in the sward to a major extent, fields closed in October would produce in normal seasons a light and stemmy crop and should therefore be closed one month earlier.

Fields for hay or silage should be in good heart and should not be made to produce these crops frequently unless they are in exceptionally good condition. The closing of a field and cutting for hay or silage tend to make the sward open and weedy and encourage inferior grasses such as sweet vernal. Such fields may continue for some time to produce fair crops of hay, but will produce little feed during the remainder of the year.

At this time of the year farmers should proceed to overhaul all the harvesting machinery used for hay and silage. This can generally be done during spells of wet weather. When the machinery was housed after the last harvest all working parts should have been well greased so that rust could not affect the efficiency of the machinery. The mowing machine in particular should be subjected to careful inspection and any parts requiring renewal should be replaced. Particular attention in this respect should be paid to the cutter bar to see that it is in perfect order and any worn sections are replaced.

In overhauling harvesting gear the condition of the ropes, masts, and booms should be carefully inspected and replacements effected of weak or worn parts. If any part is suspect it is better to purchase the replacement now than wait until the article breaks during harvesting operations, for such delays are often costly both in labour and quality of the product.

"it has TAILED over 13,000 LAMBS

"and has never gone better than now.

"NO DEATHS after tailing and lambs fatten "quicker. Last year we drafted 2035 fats from "1840 ewes, of which 1222 were drafted on "17th December."

The above is from a letter from Mr. Walter Clark, of Woodlands, Otara, R.D., who authorises its publication. Mr. Clark's experience is in line with hundreds of other farmers, who find this new, bloodless, humane method of docking with the

Severs and seals in one operation. Stops bleeding completely.

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is cleaner, safer, and quite as fast as the knife.

Users say the Baverstock more than pays for itself the first year in greatly reduced losses from blood poisoning and fewer, if any, rejects at the works. Get the facts: post coupon now for FREE folder.

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.....J.A.

Spring Sowing of Grasses

EXCEPT in very cold districts the sowing of grass can safely commence next month. In some years sowings in late August are successful in the milder climates. It is all a matter of temperature and condition of the soil; the latter should be fine, firm, and not saturated with moisture. Spring sowings are not advisable where the climatic conditions and type of farming permit of a better chance of successful establishment by sowing in the autumn. Spring sowings are advisable where there is ample summer rainfall and the winters are severe and it is imperative that the young plants be firmly established before the first severe frosts occur. In some districts where the summers are dry it is necessary to sow in the spring because of the severity of the winters. In such areas the risk of failure is great and special care has to be taken to secure good establishment.

In Canterbury and other arable districts it is common to sow pasture in the spring on land sown to cereals in the autumn and with spring-sown cereals or fodder crops. The farmer who does this obtains extra immediate production from his land, but in the long run it may not be a good practice, particularly when sowing with a fodder crop.

Light Sowings

If grass must be sown down with a fodder crop it is advisable to sow the crop on the light side so that some light will penetrate and enable the young pasture to live and make progress. Thus sowings of rape should be not more than 1lb. per acre on light and 1½lb. per acre on heavy land and turnips not more than 6 oz. The grass seed should be distributed after the fodder crop has been drilled and covered and the ground rolled. After the grass seed is sown it should be covered by a light harrowing followed by a further rolling on light soils. If the fodder crop establishes more thickly than anticipated and threatens to smother the young pasture, feed it off early to a sufficient extent to check its growth and permit the young pasture to establish satisfactorily.

The establishment with autumn-sown cereals depends on whether the ground can be surface worked well enough to cover the seed properly. If the crop is too long to permit working the ground it will be necessary to feed off the crop. Where the soil is heavy the feeding off should be delayed till the ground is fairly dry and should not be done in wet or showery weather. The ground should then be harrowed and the seed sown, followed by another harrowing, and a rolling on light soils.

Cultivation and sowing practice with spring-sown cereals is the same as that for fodder crops.

In the March notes the kinds and types of grass and clover seed which should be sown at that time of the year were fully dealt with. The mixtures advocated will prove as suitable for late spring sowing, but Italian ryegrass sown in early spring is liable to bolt to seed head and produce little leaf, and should therefore not be sown then except under very favourable conditions.

One cord of firewood measures 128 cub. ft. and is generally placed in a stack 8 ft. long by 4 ft. wide by 4 ft. high.

Tree Planting

IN the seasonal notes for May farmers were reminded that that month was the generally-accepted time for commencement of the planting season which could be continued, except in the coldest districts, throughout the winter months. In the coldest districts tree planting can be recommenced in the spring, when danger of severe frosts and extremely cold spells of weather is over. Planting, however, should not be continued in these districts beyond the end of October unless a moist summer climate is commonly experienced. In districts where the winters are mild enough to permit of planting throughout there is ample time for this work to be completed at the end of this month. In such districts where the soil dries out in summer it is not advisable to continue planting after the end of this month.

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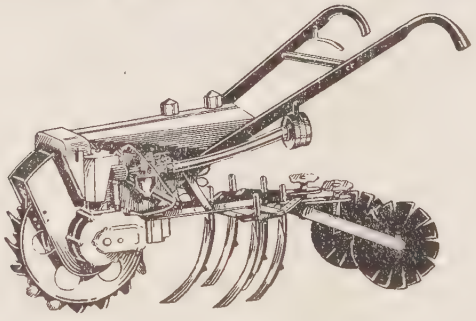

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Early Spring Harrowing of Pastures

FIELDS on which cows have been fed hay, silage, and other supplementary fodders become trampled and well coated with droppings by the end of winter. Before the grass commences to grow in the spring these fields should be well harrowed to spread the droppings and distribute the rubbish usually resulting from feeding hay and silage. If the field is to be shut up subsequently for a crop of hay and silage, a good lookout should be kept for pieces of baling wire or other material liable to cause trouble when the field is mown.

If much hay of poor quality has been fed, the older droppings will prove particularly difficult to break up, and ordinary tine harrows or tripod harrows may not prove severe enough even when weighted. There have been special harrows on the market for many years for this purpose. If the droppings are not broken up properly and spread, the pasture they cover will be smothered and that adjacent to the droppings, being disliked by stock, will not be eaten. Thus not only is latent fertility in the droppings wasted through their not being spread to the benefit of the whole pasture, but each undistributed dropping results in a small area of ground going temporarily out of production.

In the spring it is quite common to see the waste that occurs in fields on which much hay has been fed to cattle in winter. Dotted here and there are oases of taller dark green growth surrounded by lighter green short pasture. If the droppings are properly spread the oases may still be seen, but the difference in growth and colour is not so great and there is less smothering and fouling of the sward where the droppings previously lay.

In the spring the droppings do not cause so much trouble because, being more liquid, they dissolve much more quickly, their place being soon taken by pasture plants. Hence the need to harrow is not so great then as it is at this time of the year, particularly on pastures on which stock have been concentrated through the winter months.

CALVES do BEST on MOOSE

Spring Topdressing

NOW that increased fertiliser supplies are being made available to dairy farmers for topdressing purposes attention will need to be given to the best use that may be made of them.

On lime-deficient soils, whether straight superphosphate or serpentine superphosphate is used, it should be sown only on fields which previously have received ample supplies of lime.

The farmer should not be afraid to sow his fertiliser soon after it arrives. Supplies available in the spring can be used first to topdress autumn-sown pastures and secondly fields shut up for hay and silage. Next he should pay attention to those fields which have deteriorated to the greatest extent through lack of fertiliser, provided that clover is still present in the sward and the pasture has not reached the state when resowing is advisable.

Ganes before Guns

You were wrong Mister Goering! Butter *was* important. It still is. For butter is food — and food is the greatest weapon of all. Remember what Napoleon said about an army marching on its stomach? Today, with whole nations involved in total war, food is more important than ever.

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You see, "more butter", naturally follows the use of Gane Milking Machines. Every New Zealand dairyman knows that. That is why they are all pleased to hear that dairy control orders are now modified and ample stocks of Ganes are now available.

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AGENCIES THROUGHOUT NEW ZEALAND

Mole Drainage

WHILST there is no cheaper method of drainage in clay soils than mole drainage, there is no method that has been so attended with disappointing results. Probably because it is cheap farmers are apt to be more careless in planning the work and properly completing the job. Like all other systems of drainage the most important aspect and the one most likely to be overlooked is the outlet. Many a field has been traversed with the mole plough and no work done to see that the drains are properly connected with outlets protected from damage by stock.

Mole drainage is best carried out when the subsoil is moist and the top of the ground firm enough for traction. These conditions are obtained in the spring when the topsoil has dried out. The subsoil should be heavy in texture and free from obstructions such as timber or stones.

In regard to depth, it has long been generally accepted that the moles should be placed a few inches below the top of the clay subsoil. The recognised distance apart is 9 ft., but this should be varied, dependent on the heaviness of the soil texture and the amount of water requiring drainage. The fall should be either uniform or increase towards the outlet and should be apparent to the eye. On steep slopes the drains should be run across the face of the hill to prevent scouring.

Connections of moles with the major one to carry the water to the outlet should be carefully made so that no obstruction remains. The moles should discharge into a tile drain or through a tile or tiles. If into a tile drain the connection is best made with stones of scoria. The outlets from the tiles should be properly protected from stock and inspected every autumn to see that they are discharging clearly.

—J. E. BELL,
Acting Land Utilisation Officer, Wellington.

Interim Sheep Returns

THE collection of sheep returns was resumed this year following a break of two years. The interim figures supplied by the Government Statistician disclose that our sheep population has increased by considerably over one million, the principal increase being in the North Island.

Details in respect of distribution are as follows, actual figures for 1941 being shown for comparative purposes:—

SHEEP DISTRICT:	April 30, 1944.	April 30, 1941.
Auckland	4,804,410	4,179,994
Gisborne-Hawke's Bay	7,212,688	7,051,024
Wellington-West Coast	6,804,511	6,631,312
NORTH ISLAND TOTALS	18,821,609	17,862,330
Marlborough-Nelson	1,370,747	1,531,386
Canterbury-Kaikoura	5,662,696	5,412,360
Otago-Southland	7,228,266	6,945,584
SOUTH ISLAND TOTALS	14,261,709	13,889,330
DOMINION TOTALS	33,083,318	31,751,660

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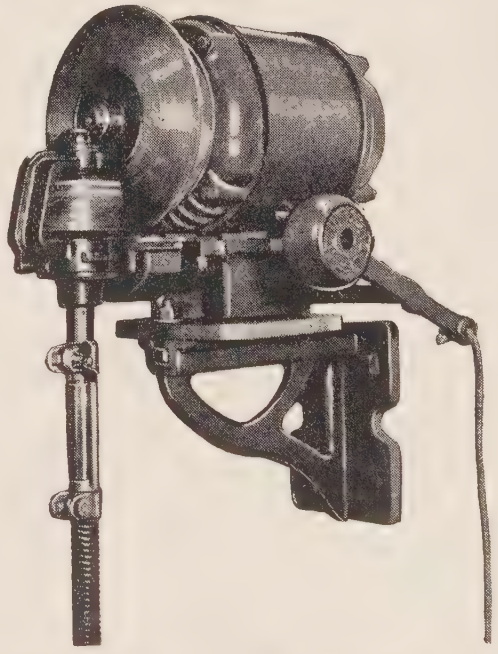
The LISTER Ball Bearing Horizontal Electric Plant

Each stand has a separate motor which drives the gear by means of a friction cone. THE FRICTION SPINDLE IS FITTED WITH BALL BEARINGS ABOVE AND BELOW THE CONE.

TESTS PROVE THAT THIS EXCLUSIVE LISTER FEATURE RESULTS IN LOW BEARING PRESSURES NOT APPROACHED BY ANY OTHER DESIGN.

The plants are fitted with the "tumbling tommy" type of "in and out" gear, thus eliminating the necessity of starting under full load and constant use of electrical switch gear.

LISTER ELECTRIC PLANTS ARE EQUIPPED WITH FULL SIZE (14 in. discs) GRINDERS.



A FRIENDLY WORD IN SEASON. Before ordering spare parts, please make a thorough investigation of what you have on hand—that is, make sure the part or parts you need are not already in the Shed. A little overhaul like this will help us considerably in meeting more urgent demands on our limited stock of "spares."

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In the Orchard and Vineyard

Orchard Notes

Essential Spring Work

DURING the coming month the general spraying of fruit trees will commence in earnest. Dormant and foundation sprays on pip and stone fruits should already have been applied and everything ought to be in readiness for commencing the general programme from the "green tip" stage of tree growth onwards. Any uncompleted winter work should be pushed forward to completion to enable full preparation to be made for the spraying season.

Too much attention cannot be given to this important phase of fruit production, and any relaxation in efforts to control diseases and pests will be reflected in the degree of cleanliness of the crop produced. Sprays are applied as a precaution against attack; proper mixing, method and time of application, and complete coverage are important features connected with disease control.

Owing to the varying conditions of climate, soil, and tree vigour which apply in the several fruit-growing areas throughout the Dominion, it is not practicable to lay down a set programme suitable to all, and local conditions must be taken into consideration.

Standard Practice

The following essential points can, however, be considered as standard everywhere:—

1. **Ensure that the spray outfit is in good order and capable of the output and pressure you require.**
2. **Make sure that spray materials are measured or weighed accurately and properly mixed before application.**
3. **Impress upon operators applying the spray that every part of the tree must be thoroughly covered.**

Recommendations for the control of the principal pests and diseases are set out in Bulletin No. 161, issued by the Department of Agriculture, which is available free of charge upon application to the orchard instructor for your district.

August Reminders

See that certified spray products are purchased.

Utilise wet days for cleaning up sheds and machinery.

Carry on with preparations for grafting.

Complete spring cultivations and apply manures.

Ensure that weighing and mixing of sprays are correct.

Satisfy yourself that all trees are thoroughly sprayed.

See that drainage problems are attended to.

The certification of approved materials used for spraying is a safeguard for the grower, as he is assured that they have been tested and approved by the Plant Diseases Division to be used at the recommended dilutions.

Grafting and Refurnishing

Growers who are contemplating reworking any number of fruit trees should have the material for the job on hand. Most of the scions inserted can be firmly secured by the use of §in. tingles, raffia is required for whip grafts, and a supply of material for sealing is necessary.

Some thought should be given to the choice of the variety which it is intended to graft on to the unsuitable or uneconomic trees from the viewpoint of market value, susceptibility to russeting or disease, and also the even distribution of labour required during harvesting and packing.

Select the scions from clean, healthy trees, and "heel" them in in a cool, moist and shady position until required to prevent drying out.

The trees to be reworked can be headed back or trimmed up in readiness either beforehand or as the work is proceeding. Use a sharp saw and make clean cuts and trim up any jagged or rough edges of bark.

Test out with a sharp knife to see if the bark is lifting freely; if it is not it is better to wait until this condition is suitable.

Changing Varieties

The three methods of changing over varieties are as follows: first, by deheading the trees low and inserting scions by rind or bark grafting into the tops of the remaining leaders.

A second method is to reduce the main limbs to about one half, thereby preserving a larger proportion of the original framework, the tops of which are rind grafted and scions inserted below as required on each limb.

The third is the method of complete "refurnishing" whereby the whole framework is retained with the exception of unwanted branches, the remaining wood being trimmed bare and shortened where necessary to stubs for grafting. Scions are then inserted in suitable places along the limbs as required by using the inverted L cut at a required angle. The tops of the leaders are terminal grafted and whips placed where necessary.

The first method is quick in operation owing to the few scions to be put

CARRYING THE WAR LOAD

Railways' Big Responsibility

Apart from their responsibility of meeting this country's domestic transportation needs, the railways are called upon to handle abnormal quantities of additional traffic—servicemen, equipment and the output of accelerated industry—a load far greater than transportation in New Zealand has ever previously known. In face of these extra burdens, can there be any wonder that people are asked to travel only if their journey is really unavoidable; is it not reasonable that rail freighters should be required to avoid wasting the time of wagons which carry their goods?

Railway Lines Are Battlelines, Today

on, but is slow in bringing the tree into bearing owing to the framework having to be rebuilt.

The second method reduces the work of complete refurnishing by half, and trees of good framework can be secured in the third season.

The third method is slower and more costly, although the trees are in bearing much sooner than other grafted trees. The error of overdoing the job and inserting scions which later prove to be superfluous and overcrowd the tree should be avoided.

Grafting can be carried on from about mid-September or as soon as the bark is lifting freely. Use a sharp knife and shape the scion with a clean cut. Make sure the cambium layer of stock and scion are in contact and seal securely to exclude air and moisture.

Frequent observations should be made of the grafted trees and reseal-ing carried out where necessary. Strip off the fresh growth of the old variety on the stock unless required for shade or any special reason.

Application of Manures

Manures should be applied evenly over the rooting area of the trees so that the trees may receive the maxi-mum benefit. The increased cost plus the enforced rationing of certain com-mercial fertilisers does not permit waste in any form.

Applications to maintain average growth and bud development are essential on the majority of orchards, but the application of excessive quan-tities of certain nitrogenous manures is both wasteful and harmful to the keeping quality of the fruit. The vigour of the tree will usually indicate its requirements in this direction, and the quantity applied per tree should be varied accordingly.

Cultivation and Drainage

As soon as the condition of the soil permits cultivation should be gone on with and a good tilth maintained throughout.

Trees should be hoed or dug round to eliminate weed growth and har-bouring places for bronze beetle. Open drains may need attention and clean-ing. Drainage for wet-lying areas should be provided.

—R. E. BINFIELD, Orchard Instructor, Hastings.

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TARPAULINS, STACK COVERS,

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Citrus Notes

Cultivation and Pruning

MOST citrus lands will be dry enough, by the month of August, for spring cultivation and turning in of any cover crops which may have been grown. The first working of the soil may be done by the plough, rotary hoe, or by heavy discing, with the main objects of thoroughly covering green material, to incorporate it with the soil, and of preparing the land for subsequent lighter cultivations during spring and summer.

Ploughing, with the aid of a drag chain, is the most efficient means of putting a green crop under the soil, but rotary hoeing or heavy discing will make a satisfactory job if the work is done efficiently. The latter im-plements usually leave some green material on the surface, but thoroughly incorporate the bulk of the crop with the soil to the depth of the cultiva-tion.

The surface-rooting habit of citrus trees should be remembered when deep cultivations are being done. De-struction of an excessive number of surface-feeding roots, especially in light soils, will give trees a serious setback just at the time when spring growth and, later, setting of the spring crop, demand full root activity. There-fore, while cultivation may be fairly deep in the middle of the rows, im-plements should be set somewhat higher near to the trees. Hand culti-vation under the trees should never be more than a few inches deep.

Pruning Time

The best months for pruning citrus trees are from August to about mid-December, although light pruning or removal of dead and diseased wood may be done at any time. Many growers find that some of this work can be done conveniently while pick-ing is in progress, especially when crops are light. Where harder cutting may be considered necessary, there will be various effects on the trees, according to the time of year that the work is done. Severe thinning of branches, or shortening of tree tops, during late autumn or winter will ex-pose to frost and generally cold con-ditions some parts of the trees which have become accustomed to partial protection from the elements by the foliage removed when the cutting out is done. This may cause a setback to the trees should severe weather follow before they are able to adjust them-selves to their new comparatively ex-posed condition.

Heavy cutting during hot summer weather is likely to subject fruit sud-denly to the effects of sun-scorch, al-though sun-burning rarely affects fruit which has happened to set and mature in an equally exposed position. A tree thinned to such an extent as to bare its limbs to sudden full summer heat may suffer from injury to those limbs.

A main pruning in late summer or early autumn has the effect, in many instances, of inducing a flush of wood growth which cannot mature in time to go through the rigours of winter conditions without injury to the tender tissues.

Therefore the most suitable time for pruning is spring and early summer, for during those months most of the above-mentioned ill effects will be avoided. Pruning of lemon trees is rarely possible without some loss of developing fruit, but the work may be conveniently delayed until most of the main crop is removed from the trees.

Seasonal Work

Spring plantings of citrus trees should be completed.

Check spraying equipment and arrange supplies of materials for spring sprays.

Spring cultivation, turning in of cover crops, and application of fertilisers should be well in hand.

Commence main pruning of citrus trees.

ISSUED BY THE
DEPT. OF HEALTH
DON'T WASTE
YOUR VEGETABLES
You need plenty of vegetables. Grow your own if possible. Every day have potatoes and at least one green or one yellow vegetable (carrot, swede, yellow turnip, etc) plus any other vegetable you like (onions, parsnips, beets). And remember—the secret of nutrition is in the cooking.
SPEED, SPEED! Don't shred or cut green and yellow vegetables until the water comes to the boil. Exposure to air when cut up, or long drawn out cooking destroys vitamins! Use the dark outer leaves of greens as well as the pale inner leaves. Use a very small quantity of salted water, put the lid on the saucepan and cook quickly. Green vegetables should be tender in 10 to 15 minutes. Then drain and serve immediately.
VITAL TIPS FOR VITAMINS. Use the vegetable cooking water for soup, gravy or sauce. Never throw it away. Don't use soda if you want nice, crisp vegetables. Potatoes should be baked or boiled in their jackets. Serve "other" vegetables when possible with white or parsley sauce made with dried skim milk.
THE GOLDEN RULES
● 1 Prepare and cook all vegetables quickly, with the lid on.
● 2 Serve all vegetables as soon as cooked.
● 3 Use the vegetable cooking water.
Vegetables are the test of the good cook
25
FOR A HEALTHIER NATION

Cutting back and thinning out of limbs in spring, the natural period for quick recovery of the trees, has a number of advantages. The worst winter weather will be past, trees will pick up quickly after their comparatively dormant winter period, while fruit and limbs will not be exposed to the very hot summer weather before new foliage growth has given them some measure of protection. New growth encouraged by pruning will have ample time to mature and fill up gaps in the tree framework before winter weather is able to do any harm.

Severe Pruning Unnecessary

Very severe pruning of citrus trees should not be necessary, and almost certainly results in considerable loss of crop for one or more seasons if carried out on bearing trees. Should the orchard be in a condition demanding severe treatment, the pruning may be spread over several seasons with less check to the trees than would be the case if all the work were done in one season.

If young trees are fairly severely trained to four or five main leaders, and are kept well opened up for the first six to eight years of their lives, they should have formed into sturdy, well-shaped trees requiring relatively little hard cutting in later years.

In general, lemon trees respond to somewhat more severe pruning than appears justified with other citrus trees. The trees should be kept thinned out to encourage fruiting wood on inside as well as on outer branches of the trees. Vertical "water shoots" should be suppressed, unless they are required to fill a space in the tree frame, in which case they should be shortened to encourage branching. Excessively long side and top growths need shortening back, while all spent wood, dead twigs, and diseased branches should be removed. Branches hanging on to the ground require shortening or removal. Sweet oranges and New Zealand grapefruit need rather less thinning out of branches, but treatment in other respects should be similar to that given to lemons.

No stubs should be left when limbs are removed from any citrus tree, and all cuts more than about three-quarters of an inch in diameter should be carefully painted over with a wound dressing. The dressing should be renewed annually on large wounds.

—I. L. NOTTAGE,
Orchard Instructor, Auckland.

Complete spray schedules for the control of citrus fruit diseases and pests in New Zealand are included in Bulletin No. 20, "Recognition and Control of Citrus Diseases in New Zealand," which is available free from offices of the Department of Agriculture.

Guide for the Home Garden

Work for September

"There is land enough and seed enough,
There are tools enough and people enough
To grow and preserve food enough—IF"
—A Victory Garden Slogan.

"If you will play your part in horticulture,
And dig your soil and then prepare to sow,
If you would have an ideal Victory Garden,
Then you must learn to cultivate and hoe."

MR. CLAUDE R. VICKARD, U.S.A. Secretary for Agriculture, has said, "Food will win the war and write the peace." The real meaning of this statement is that the restoration of all belligerent countries to peace-time conditions will be simplified if food supplies are plentiful. The home vegetable garden, therefore, has its part to play, the importance of which cannot very well be over-estimated. "**September** for seed sowing" is a maxim worthy of adoption when laying plans for the coming season. There are few home-grown vegetables the seed of which cannot be sown during September, that is, providing proper care and discretion are exercised concerning the different varieties selected.

Sow Sparingly

It should be emphasised again that sowing more seed than is necessary for the production of the number of plants required is not only a waste of seed, but often results in weak, spindly plants, due to overcrowding in the seed-bed. Seed should be sown sparingly, and, during September, shallow soil coverage will suffice, if precautions are taken to prevent undue evaporation of moisture from the surface soil. An important point which should be observed is that when a seedling box is used for seed germination it is advisable to keep it covered, preferably with a sheet of light-coloured paper—newspaper will be suitable—until germination starts, after which instant removal is necessary.

Cabbage: Summer cabbage plants which may not yet be set out should be planted without further delay. If home-grown plants are not ready, it may be more profitable to buy what is required, rather than miss the opportunity of securing the early growth of plants of this variety (Golden Acre). These will follow closely on after Flower of Spring, and, as will be advised later, can largely be made an addition to a winter savoy planting. Harvesting the spring cabbage mentioned above should now be going on. If, by the middle of September, the bed has not been properly thinned out by cutting, those remaining are not likely to develop into full-hearted specimens. It would therefore be more profitable to make plenty of room for development, even at the risk of losing a few which may be only partly hearted.

Celery: September is considered the earliest month for sowing celery seed in the open. Golden Self-Blanching, as an early variety, is quite suitable, and in order to ensure sufficient plants to meet requirements allowance should be made for germination failure or weakness. Although there are between 80,000 and 90,000 celery seeds in 1 oz., the average germination rarely exceeds 65 per cent. Part of this failure may be due to the length of time the seeds take to germinate—2½ to 3 weeks. The soil in which celery seed is sown should be of very fine tilth, and it is an advantage to have it passed through a fine sieve. A shallow box is best, and when the seedlings are 1½ to 2 in. high they should be pricked out, either into larger and deeper boxes or in a sheltered part of the garden, allowing 2 in. each way between the plants.

Asparagus: The area occupied by the roots should be kept conspicuously free of weeds, and as soon as the first spears begin to show nitrate of soda, 1 oz. per sq. yard, may, with advantage, be broadcast over the bed. Plenty of good freshly-made liquid manure may be used as a substitute.

Lettuce: A few seeds broadcast into a box of soil, which should be maintained in a moist condition, will keep up the necessary supply of young plants. It should be remembered that tender, crisp lettuces can be produced only by rapid growth. They require a rich soil, plenty of water, and, when hearting, either a pinch of nitrate of

Don'ts

DON'T neglect "banking up" soil on the early potato crop. Exposure of tubers affords a favourable opportunity for the depredations of the potato tuber-moth.

DON'T dig in a non-leguminous green-manure crop immediately before setting plants in the soil on top of it, unless sulphate of ammonia, 1oz. per square yard, is broadcast over the area before digging is begun. Lupins, or other legumes, can be dug in any time—better not too mature.

DON'T overlook laying the foundation of the next compost heap. All that can be properly made on the garden will be required.

DON'T always blame poor germination on the quality of seed supplied by the seedsman. Try to improve the practices which have previously been adopted.

TOMATOES

TATURA GLOBE DWARF—August is the month to sow your Tomato seed, and as usual, we are on deck with the latest and best. We have secured a small supply of the new dwarf, which is not heavily wrinkled like the Australian Dwarf, but smooth round globe. This is we think, destined to entirely supercede the Australian Dwarf, being much earlier, a better cropper, and highly blight resistant. It is equally suitable for outdoors or the glasshouse and needs no staking. Seed sown this month should give you ripe tomatoes before Christmas. 1/6 pkt., 1/8 posted.

CARLTON VICTORY TOMATO—Of the tall varieties this is the pick, for it produces immense crops of large fruit, often up to 1¼ lbs. There is no core, very little seed, and good solid flesh right through. For main crop you cannot better Carlton Victory. 1/6 pkt., 1/8 posted.

POTENTATE—Smooth, round, comparatively small, going about 4 to lb., it is a marvellous cropper, the fruit hanging in immense clusters. The flavour is good, and it is the perfect shop tomato. 1/- pkt., 1/2 posted.

CARLTON SEED CO
263 KARANGAHAPE RD. AUCKLAND

soda or regular applications of liquid manure.

Rhubarb (spring): The remarks made concerning asparagus are appropriate for this crop. Seed-stalks should be removed as soon as they are observed. Permitted to grow and set seed, the plant is robbed of considerable plant food.

Peas: Although seed may be sown very early, it is doubtful if much is gained, and a great deal may be lost by sowing earlier than August, particularly where severe weather conditions obtain. A rich, moist, well-drained soil, which contains abundance of organic matter, and which has been dug over in autumn, is ideal for a pea crop. Good crops may, however, be produced on most types of soil, except heavy clay. Blood and bone manure, 4 oz. to each 9 ft. of row, may be applied and worked into the top soil. The seed is best sown 1½ in. deep at the bottom of a shallow trench, which may be made with an ordinary garden vegetable hoe. The edge of the blade is sunk into the soil and pulled along the line of row. A short distance with each pull will make a better job than continual dragging. W. F. Massey is an appropriate early variety, which can be followed by Greenfeast, Richard Seddon, or Stratagem.

Leeks: What remains of this crop should now be used, as with the advent of warm spring conditions seed stems are sure to develop. It is one of the most valuable vegetables usually grown in the garden, and preparations may be made now for sowing seed for a small early bed. The main sowing can be made later. Seed can be sown in rows in a seedling box not less than 4½ in. deep or in a sheltered part of the garden. The seed is best sown in rows, so that weeds may be kept under control while the seedlings are developing. Musselburgh or London Flag are suitable varieties.

Potatoes: If it is intended to grow a main crop the seed, if not already obtained, should be secured without delay. It is not considered necessary to "shoot" main crop seed; but if the area it is intended to use is at present occupied by a crop, the seed will be maintained in much better condition if set out in seedling boxes than if kept in a sack.

Tomatoes: In the previous issue of the Journal it was suggested that sufficient soil might be sterilised in which tomato plants could be grown to meet the season's requirements. In view of the vital importance of this crop, soil sterilisation is of vital importance. The tomato plant is classed among those which are very susceptible to disease attacks, and as many of the diseases which do affect the plant are soil-borne, sterilisation of the soil, preferably by steam, is the most practical and efficient means of destroying the responsible agents. As to how relatively small quantities of soil may be effectively and cheaply treated, home gardeners are referred to the June, 1943, issue of the Journal. This publication contains a sketch plan and full directions for carrying out the operation.

After sterilisation the soil may be used for sowing seed in two or three days, but no nitrogenous fertiliser should be mixed with it. Provided the soil treated was ordinary good garden soil which perhaps had been mixed with, say, one-third its weight of good compost, manures of any kind will not be necessary for growing seedlings up to the stage when pricking out is done.

For raising seedlings a small box 10 in. x 10 in. long by 2½ in. deep should be filled with the treated soil, pressed well down, and levelled off on top by pulling a piece of timber

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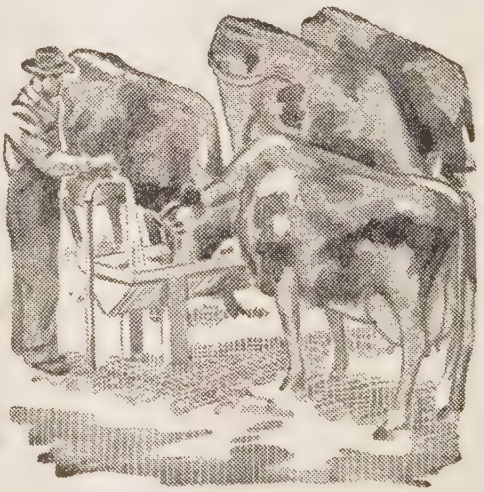

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along the sides. In furrows ¼ to 3-8 in. deep the seed should be sparsely sown, pressed into the soil, and covered with some of the sterilised soil which has been passed through a fine sieve. This operation being completed, the whole of the soil on top of the box should be gently but firmly pressed with a piece of dressed timber and covered with a sheet of glass, on top of which is laid a piece of newspaper. Before germination the sheet of glass should be turned daily. As soon as the seed begins to sprout all covering on the box should be removed, but no bright sunlight should be allowed direct access to the germinating seedlings; this is very important. Growing these seedlings is not a difficult job, but care and attention are necessary, and success brings a great amount of satisfaction.

According to the methods adopted during propagation, the seedlings will be ready for pricking out in 14 to 21 days, and by the end of this period they should be properly hardened off. Gradual exposure to lower temperatures is the safest method of achieving this. If tomato seed has not yet been obtained, or if none were saved from last year's crop, a trial might be made of Best of All. From experience it can be stated that it will stand sunshine after rain without cracking better than most varieties. It bears rather larger round fruits, but these are firmly held in good trusses on vigorous growth.

Turnips: Early sowings of these which may have been made during favourable weather conditions will, with the advent of spring, show a tendency to "bolt" to seed. As soon as this is noticed the entire bed should be dug in and fresh seed sown in another part of the garden. It is a quick-maturing crop and is only palatable when young and fresh.

Radish: An odd corner of the garden can always be utilised to advantage by a small sowing of radish seed. With good soil and moist conditions the seed may be sown and the crop harvested in from 6 to 7 weeks. Successional sowings of small quantities of seed are most desirable, as the product can be used only when tender.

Carrots: In areas where the carrot rust-fly is prevalent sowings of carrot seed should be deferred until late November or early December. Fortunately, this remark does not, at present, apply to the South Island, where, so far as is known, the pest has not yet been recognised as having attacked carrots. Where thinning is carried out in existing beds care should be exercised to see that the soil is pressed firmly against the crowns of the roots remaining in the ground.

Cauliflowers: During September seed should be sown to produce plants for late autumn maturity. The seedlings may very well be grown in a box 4½ to 6 in. deep, or in a part of the garden where they will obtain plenty of sunshine and fair exposure. During late spring and summer young plants, if grown in carefully-sheltered spots, will not acquire the vigorous constitution necessary to withstand subsequent growing conditions. Phenomenal, Southern Cross, and Metropolis are recommended varieties.

—D. K. PRITCHARD, Instructor in Vegetable Culture, Wellington.

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Seasonal Work for Beekeepers

Apiary Management

AUGUST is the month that generally marks the commencement of a new season for the beekeeper. Correct apiary management in the autumn is reflected in the successful wintering of bees; it also has a very great bearing on the ultimate results secured in the coming season. Colonies with young queens of good breeding and supplied with ample honey and pollen are in ideal condition to survive the rigours of our worst winter and build up in the spring into populous colonies, capable of bringing in large crops.

Good Beekeeping

The three main principles required for successful beekeeping are:—

(1) **Good equipment;**
(2) **Good bees;**
(3) **Correct apiary management.**

Before the commencement of a new season every beekeeper should look back on the results of last season's activities and consider if the crop was as good as it should have been. Perhaps the hive equipment was in such a dilapidated state that many of the colonies died out during the winter and the greater part of the honey flow was used in replenishing stocks, or the bees may have deteriorated into such a poor strain, through lack of systematic queen rearing, that the colonies did not have the force of worker bees necessary to bring in big crops of honey during the season. Perhaps when the honey flow came on with a rush the apiarist found most of his stored combs had been ruined by mice or the ravages of the wax moth, and by the time these were replaced with comb foundation the honey flow was past its peak.

Now is the time to resolve that the bees are going to get the required amount of attention in order that they can prove just what they are capable of doing under favourable conditions and treatment.

Work for Month

Beginners in beekeeping should not be carried away with the idea that because this is the first inspection of the season it will be necessary to pull the hives completely to pieces. The first inspection should be carried out with the greatest speed and the minimum of disturbance to the bees. At this inspection the beekeeper should ascertain the following: Has each colony sufficient sealed honey to carry it on to the time when the first spring flora may become available to the bees provided weather conditions are favourable; also, has each colony a laying queen and to what extent has brood rearing developed, and is all hive equipment in the apiary sound?

Foul Brood

It is generally considered that September or the early part of October is the most suitable time to detect any infection that may have been picked up during the autumn and winter. By this time weather conditions should have improved and the strength of the hives greatly increased, thus preventing the risk of the brood being chilled while closely examining every brood comb. It should be remembered that any manipulations with the bees should always be carried out as expeditiously as possible. This will avoid any chance of chilling the delicate brood and tend to check the possibility of

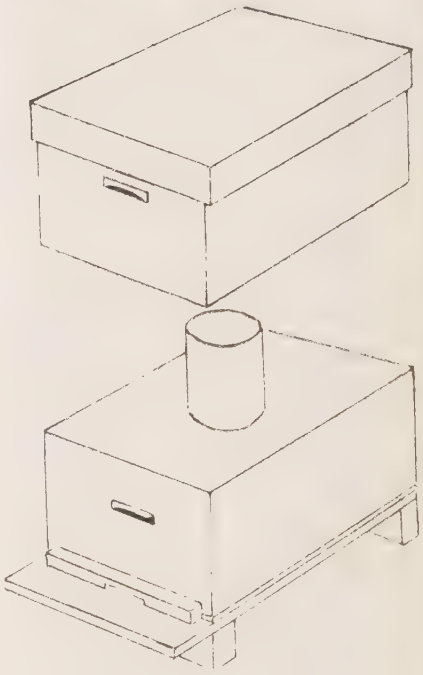

Fig. 3.—Tin inverted over hole in mat.

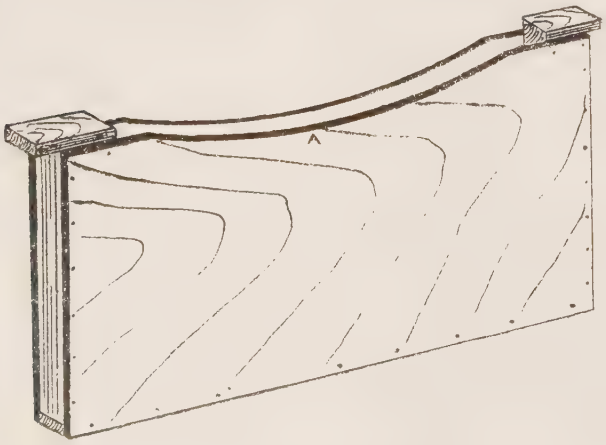

Fig. 1.—A division board feeder.

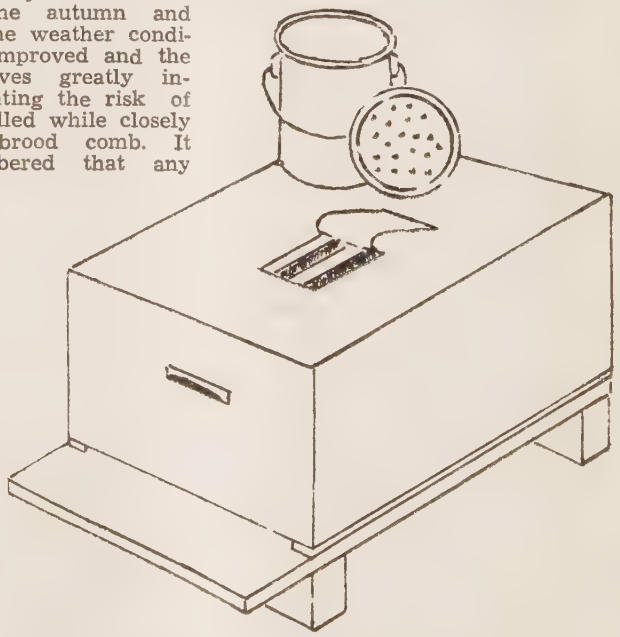

Fig. 2.—Square, cut on three sides only, in centre of mat.

starting a severe case of robbing in the apiary.

Honey Requirements

The amount of stores used in a normal winter is very small in proportion to the amount consumed once brood rearing commences in the spring. Scientific investigation in America has recently proved that an enormous amount of pollen is consumed by a colony during the season. Pollen is just as essential as honey for the development of the larval bee. It would, therefore, be unwise to discard too many pollen-clogged combs, as they may be very useful during a period of unfavourable weather.

When a colony has no sealed honey at this time of the year, it is then necessary to supplement its stores immediately. Only colonies definitely short of food should be artifically fed at this period. Suitable food is prepared by mixing sugar syrup in the strength of approximately two parts sugar to one of warmed water, dissolving the sugar thoroughly.

Method of Feeding

Division board feeders are favoured by most commercial beekeepers, being very suitable for rapid feeding, and no other equipment is required. They are made either of tin-plate or three-ply wood to approximately the same dimensions as a frame. (Fig. 1.)

When made of wood the feeder requires to be dipped in hot paraffin wax to prevent leakage of the syrup. Inside the feeder is a loose piece of wood which rises to the surface as the liquid is poured in. This acts as a float which prevents the bees from drowning in the syrup.

To use this type of feeder an empty comb needs to be removed (generally the outside one), and the feeder placed as near as possible to the brood nest by adjusting the frames accordingly. This enables the bees quickly to locate and remove the syrup. Once this feeder is in place all that is necessary is quietly to turn back one edge of the hive mat and pour in the required amount of warm syrup. All feeding operations should be carried out towards evening to avoid the possibility of robbing.

Friction Top Tin Feeder

This type of feeder is not suitable for a commercial beekeeper, as it requires the use of an empty super, but would meet the requirements of smaller beekeepers in view of its cheapness and ease of manipulation.

Any clean, sound tin having a large tight-fitting lid can be used, e.g., 5lb. or 10lb. honey tins. The lid is punctured with about 20 holes made with a nail of a size used in assembling frames.

To conserve the heat of the hive it is advisable to cut a round hole in the centre of the mat of slightly less diameter than the lid of the tin. The mat can then be used for successive feeding purposes. Another method of preparing the mat is by marking a square in the centre of a size that can be covered by the tin and then cutting three sides only. (Fig. 2.) The flap is folded back on the fourth side. After feeding this flap can be turned back into its original position.

When the tin has been filled with warm syrup and the lid is firmly pressed on, it should be quickly inverted over the hole in the mat. (Fig. 3.) Now place an empty super over the tin and replace hive lid. This method of feeding places the syrup right over the brood nest and enables the bees to have access to it during all kinds of weather. The vacuum created in the bottom of the tin when it is turned upside down prevents the syrup from leaking out, but allows the bees to suck it out through the small holes in the lid.

Summary

It must be remembered that feeding in the early spring is for the purpose of replenishing stores and is an indication generally that the beekeeper has failed to leave sufficient honey when closing the bees down in the autumn. Feeding at this period of the season should not be confused with stimulative feeding resorted to at a later date to encourage maximum brood rearing.

On fine days quickly check over all colonies and note:—

(1) Amount of stores (honey and pollen) available;

(2) Condition of queen (laying or otherwise);

(3) Condition of equipment.

Clean floor boards of all debris accumulated during the winter and replace any damaged or wet hive mats or lids. Make the colonies as compact and comfortable as possible by removing any supers of empty combs. Clean all grass from around the hives and prevent excessive dampness and deterioration of equipment.

—C. R. PATERSON, Apiary Instructor, Hamilton.

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Brooder-Houses

— By —

F. C. BOBBY,
Superintendent of Poultry Husbandry, Wellington.

WHILE successful rearing depends in large measure on good management and efficient brooding equipment, much in the way of success will depend upon sound housing. Two conditions which are disastrous in chick-rearing are draughts and dampness. A well-constructed brooder-house can eliminate these two undesirable conditions. In addition the house can be made to conserve warmth in late winter and early spring, and yet give ample ventilation when the warmer weather comes.

As in the case of laying-houses, brooder-houses should face north, in order to catch the maximum of sunlight. They are usually built on the lean-to principle of roof, and may have the greater height either in the front or back wall. The former type is the more common, but the latter is employed more successfully, particularly in the South Island or in other cold districts.

In most cases brooder-houses are divided into sections or pens, the number of which will obviously vary according to the number of chicks to be reared annually. The size of each pen will vary according to the size of unit of chicks selected. It is strongly recommended that this should not exceed 250 chicks. Bigger units can be handled successfully, but on an average, where a bigger unit is adopted, the tendency is for increased mortality and less evenly grown chicks. The larger the unit the greater the competition among the chickens. This leads to the less robust birds suffering an unwanted check. Accordingly, Figs. 1, 2, and 3 show a front elevation, a side elevation, and a plan of a typical brooder-house, containing pens of 200-chick capacity. The floor-space allowed (12ft. x 16ft.) is sufficient for the birds up to an age of 6 to 8 weeks, at which age they are ready for transferring to the growing-houses. Should it be desired to perch the birds in these brooder-pens, perches may be fixed at the back of the pens and the chickens taught to perch, as illustrated in Fig. 4.

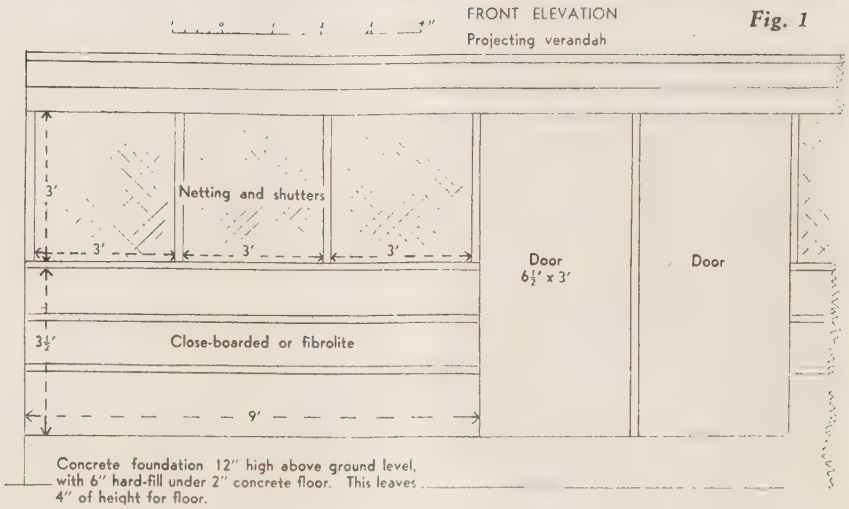

Fig. 1

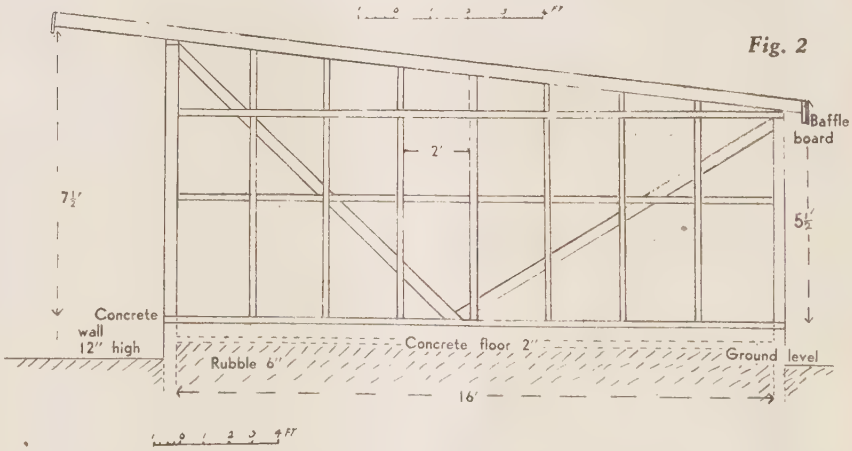

Fig. 2

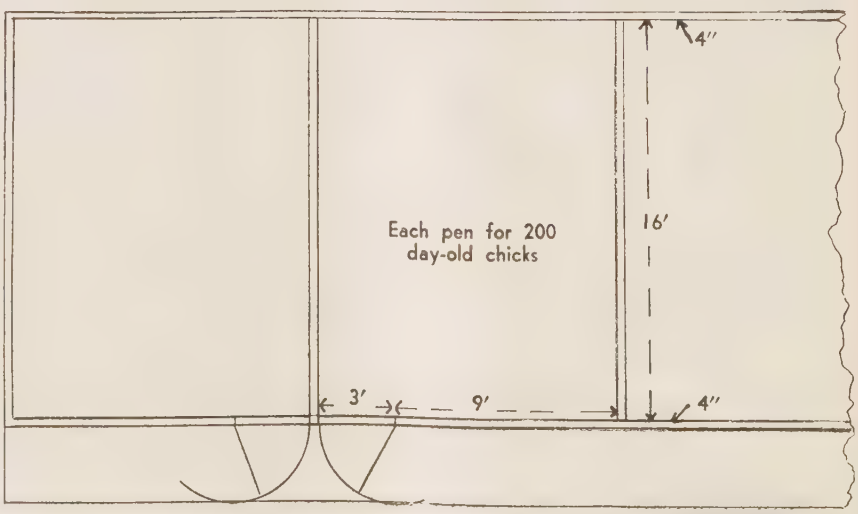

Fig. 3

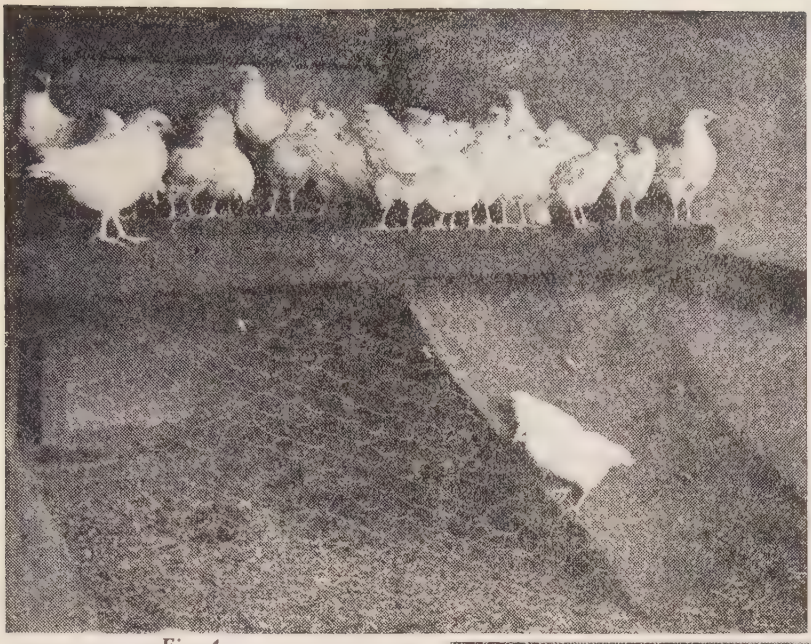

Fig. 4

ESSENTIALS OF A BROODER-HOUSE.

The Floor

Either wooden or concrete floors are suitable for chick-rearing. The former are **warm and dry** if kept above ground level, but they must be constructed of sound, dry timber, to prevent cracks in joints following any warping. They are reasonably easy to clean, while any disease germs may be destroyed by creosoting at least once annually, before each rearing season. Concrete floors are commonly used, and in order to get a dry floor they should be **raised well above ground-level**—by first putting down a hard core of rubble, stones, or other coarse material. This prevents moisture from the ground striking upwards during wet weather, particularly in the instance of heavy soils. Dampness in litter of chicken-houses is one of the most common causes of outbreaks of caecal coccidiosis, and is therefore something that must be avoided. It is essential to finish a concrete floor with a smooth surface, in order to facilitate cleaning.

Ventilation

As in laying-houses, good ventilation may be achieved by an inlet at the top of the wall at the back of the house, as illustrated in Fig. 5. In cold districts there is an advantage in having this opening controllable, since it may be desirable to close it during cold weather and while the chicks are under a fortnight old. Later, as the weather becomes warmer and the chicks older, the inlet may again be opened.

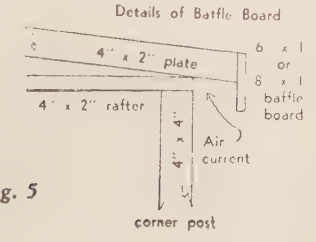

Fig. 5

As shown in Fig. 1, 3ft. of wire-netting is put into the front of the house. This allows ample fresh air and sunlight during favourable weather, but will need screening or covering at night or during inclement weather when the chicks are very young. There are many methods of protecting the front and so conserving warmth when required. Some poultry-farmers use only sacking hung up on nails at such times as it is required. Others fix a light wooden frame covered with calico, these shutters being either hinged at the top and swung back towards the roof when not required or just fitted in with buttons between the studs

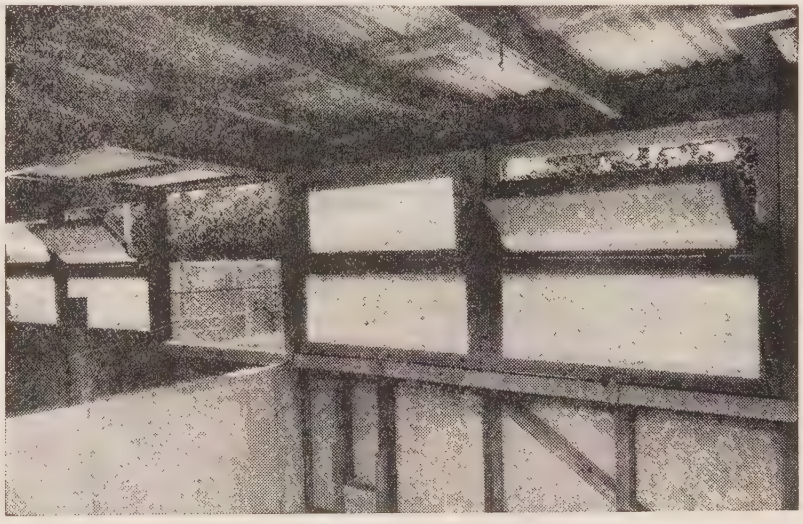

Fig. 6

Fig. 7

holding the wire-netting and completely removed when not needed.

Fig. 6 illustrates a more complicated method of protecting the front, but one which allows of full control of ventilation during all kinds of weather. These shutters are made of light timber, covered with calico. Fig. 7 shows a brooder-house to which this type of shutter has been fitted. Furthermore, the brooder-house illustrated is a good example of a lean-to house with a lower front and higher back wall.

Apart from the necessary ventilation described above, every endeavour should be made to avoid draughts from cracks and other openings associated with poor materials or construction.

Permanent Fittings

Generally, no permanent fittings are necessary other than the shutters just described. Sometimes a permanent and automatic watering system is installed, but movable water fountains are more commonly used. Again, it is particularly difficult to construct a dry-mash hopper which is suitable for young chicks at a week old, and also for the same birds six weeks later. In consequence, it is not usual to construct any permanent hoppers when building a brooder-house.

Outside Runs

Except when it is intended to raise chicks intensively it is customary to provide each brooder-pen with an outside run into which the young chicks may go when they are a week to 10 days old. These runs are usually grass-covered and divided one from another by fine-mesh netting. It will be seen, however, in Fig. 7 that the runs in this instance are divided by wooden divisions topped with wire. The wood at the bottom of the dividing fence has the effect of affording protection to young chickens from strong ground winds; also in hot sunny weather these same boards throw some shade in the pen, which is appreciated by the chickens.

(To be continued.—Next article, "Growing-houses.")

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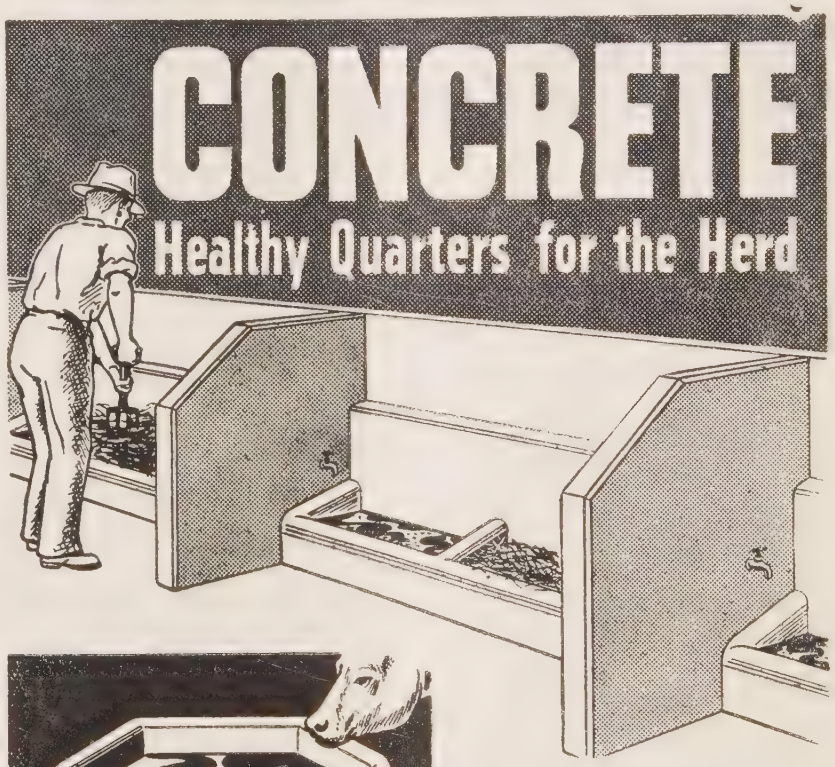

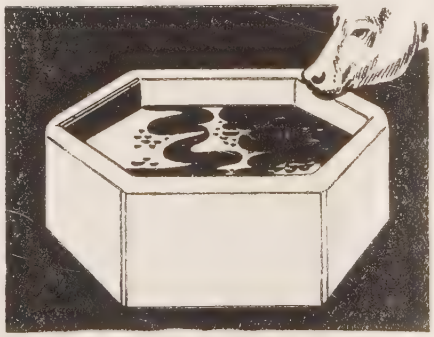

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Federation of Young Farmers' Clubs

New Zealand Federation of Young Farmers' Clubs

TENTH ANNUAL REPORT

The tenth annual report of the New Zealand Federation of Young Farmers' Clubs (Inc.) was presented at the annual general meeting held at Timaru on Friday, July 21, 1944, by the Dominion president, Mr. T. E. Streeter.

I HAVE pleasure in presenting to you the tenth annual report of the New Zealand Federation of Young Farmers' Clubs. The year under review has again been a difficult one, but our organisation has been kept intact, and I am gratified to be able to state that everywhere, among our active units throughout the Dominion, there is a better and more healthy tone prevailing.

There is a perceptible movement in the direction of a strengthening of the existing clubs, and a revival of many of those that were forced by war conditions into temporary recess. This movement may appear slow, but it is nevertheless very definite, and I am certain that we can look forward to the coming year as one of progress. I am not overstating the case by asserting that we owe much of this to the fact that during the two previous years, the most critical period through which our organisation has passed, a strong hand was at the helm, to guide us through the troubled waters and bring us out, sadly battered it is true, but still on an even keel. The efforts of our immediate past president, Mr. D. S. Ross, during his two-year term of office, have been mainly responsible for our feeling of greater security today, and my own task in the past year has been correspondingly lightened. With victory and peace now in sight we hope that the time will soon be here when we can look back, with pride and satisfaction, on the part that our Dominion has played in the struggle. Our one hope will be that the effort and the sacrifice will not have been in vain, and that out of this chaos we as an organisation will be able to contribute much towards restoring order and rebuilding a better world for the youth of tomorrow.

We can and should be proud of the knowledge that our Y.F.C. movement has borne its share of the burden, and we honour those of our comrades who have journeyed overseas to fight our battles, many of them, alas, never to return; we shall not forget them. Neither must we forget those who have striven at home on the "production front" to keep up supplies and foodstuffs for the fighting forces and the people of Britain. So far as our movement is concerned we have the knowledge also that we have done our best to keep faith with our members overseas, and we shall be able, as an organisation, to welcome them on their return, and do our share in assisting them back to their way of living. There is still much to be accomplished —there are still many of our clubs and district committees that need reviving —and it behoves every one of us to make the effort, taking advantage of every opportunity that offers, and do our utmost to bring our movement up to full strength again. Some good work has already been done, and many new members from among those without military obligations have been enrolled. Our campaign to establish clubs in high schools and secondary schools has met with a fair measure of success in both islands, and there appear prospects of more clubs of this nature being formed in the near future. This is all to the good, for not only must we honour our pledge to our members returning from overseas, but we must very definitely realise our duty to the younger members of the community.

Position of Clubs

	Before the War.	*July, 1943.*	*Present Date.*
Otago-Southland ...	35	12	14
Canterbury	38	17	21
Wellington	77	18	18
Auckland	53	15	19
	203	*62*	*72*

During the year a further nine clubs have ceased operations, these being "border-line" cases this time last year; it is considered possible, with the improved conditions generally, to revive most of these clubs during the coming year. The position has been offset by the revival of 8 clubs in various parts of the Dominion (all of them with the promise of strong memberships), and the formation of 11 new clubs during the year; these latter include 7 new clubs formed in high schools and secondary schools, 2 new clubs in country districts, and 2 clubs in Air Force units (namely Nelson and Ohakea). As the figures indicate, our total number of clubs has been increased during the year from 62 to 72;

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ADDRESS .....

..... J.A.

this is all the more satisfactory when it is coupled with the fact that most of the existing clubs have strengthened their position materially by the enrolment of younger members. In many cases also the return of members from overseas has assisted in putting new life into the clubs.

Y.F.C. in Forces

An indication of the esteem in which the Y.F.C. movement is held by our comrades overseas, and the extent to which it has entered into their lives, is given by the formation and successful operating of 4 Young Farmers' Clubs in the Middle East, and a chain of 14 among the troops in the Pacific. A number of the latter will be disbanded with the return of troops from the Pacific area, and clubs throughout New Zealand should gain in both membership and morale as a consequence. Nothing has been heard for some time regarding the club formed in a prisoner of war camp in Italy, and we trust that its members are safe and well. A club has also been formed in an Air Force unit somewhere in the fighting zone.

I would like further to stress the necessity for district committees to realise that they can be either the strongest or the weakest links in the chain of our organisation. This is a matter on which I hold very strong views. In parts of the Dominion we have had the spectacle, during the past two or three years, of clubs representing whole districts ceasing to function, with very little attempt on the part of their district committees to arrest this. The difficulty now arises that, with practically no trace of the organisation left in these areas, it is a big task for the councils concerned to find contacts with a view to starting a revival. I feel also that some of the clubs that went into recess during the past year could have been encouraged to carry on had their district committees realised their responsibilities; in many cases these clubs were the sole survivors in their particualr areas. I wish to make an appeal to all district committee members, and to all those members of the farming community who have given us so much assistance in the past, to do everything within their power to help us to revive the many clubs that are in temporary recess, and so build up the Y.F.C. movement to its pre-war strength. I would remind those interested that a younger generation has grown up amongst us, and I feel certain that in most country districts there are sufficient young men to re-establish most of the old clubs.

Younger Membership

I would also like to remind members, and all those associated with the clubs, that with the younger membership generally, as is the case in most units, it is very necessary to take every care to ensure that all activities are made sufficiently interesting and attractive to hold these younger members together. They are keen and interested in the movement, and are prepared to put all they can into it. On this account it is of paramount importance that the older and more experienced members should do their utmost to encourage them and make them realise that the movement is theirs. It is gratifying to see this spirit prevailing in some of the clubs that have been enabled to carry on solely by the recruiting of junior and high school members. There are one or two outstanding examples of what can be done in this direction, and the older members concerned are reaping their reward in the knowledge that they are accomplishing something of real value to the younger members and to the Y.F.C. movement as a whole.

The Dominion executive committee has met only twice during the period; at Christchurch in October last, and here, at Timaru, last evening. A meeting to be held at Wellington in April last was unfortunately abandoned owing to rail travel restrictions. The October meeting, while not very large, was attended by delegates from all four councils, and some very good

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work was done. During the year I have endeavoured to make contacts with the various provincial areas. I have been able to attend the annual meetings of the Otago-Southland, Canterbury, and Wellington councils, and whilst in the Auckland Province for the purpose of delivering a radio talk from 1YA I visited the Bay of Plenty, where special combined meetings of clubs had been arranged. I also attended a meeting of the Otago-Southland council held at Invercargill last August; this was followed by a very successful field day arranged by the Western Southland district committee. Council meetings appear to have been well attended and productive of excellent results.

Club Activities

A number of field days have been held by district committees, in some cases for the specific purpose of reviving the movement within their particular areas. These have taken the form of stock demonstrations, etc., and in some instances stock-judging competitions have been successfully undertaken; a few districts have also been able to carry out inter-club debating contests. This activity has, however, been limited by the transport difficulties. Club activities have of necessity been largely confined to meetings, but occasional field days have been held. The clubs generally have shown great resource in carrying on under the handicaps imposed by war conditions, and have arranged impromptu speeches, debates, etc., among their members; they have also overcome to a large extent the scarcity of outside lecturers by drawing on farmers and others within their own districts, and have thereby tapped a source of knowledge and experience that in many cases has hitherto been overlooked.

An added difficulty in connection with the revival of clubs and district committees has been the fact that during the past few years many of the officers of the Department of Agriculture who have been acting as district secretaries have, on account of extra duties imposed on them in connection with the war effort, been able to devote little or no time to the Y.F.C. movement. The position has been overcome to a great extent through the kind offices of Mr. P. W. Smallfield, director of the Fields Division, who has shown his interest in our organisation in a very practical way. He arranged during the year for Mr. P. S. Syme, instructor in agriculture, Warkworth, to take over the secretaryship of the Auckland council and keep in touch with Y.F.C. affairs throughout the Auckland Province, and for the organising secretary, Mr. S. Freeman, to be transferred to Palmerston North and act as secretary to the Wellington council, and also take over the secretaryship of the Wanganui, Manawatu, Southern Hawke's Bay, and Horowhenua district committees. In the Bay of Plenty Mr. Gordon Spratt, a club member, has very capably acted as district secretary; one feels tempted to suggest that his example could have been copied with advantage in districts where the whole organisation appears, for the time being, to have died out completely. At this juncture I would like to pay a tribute to the officers of the Department of Agriculture, whose work before the war was largely responsible for the extensive progress made by our organisation. We hope that the time is not far distant when we shall again have their full assistance and co-operation to help us to build up the Y.F.C. movement ready for the part it will be called upon to play in post-war reconstruction.

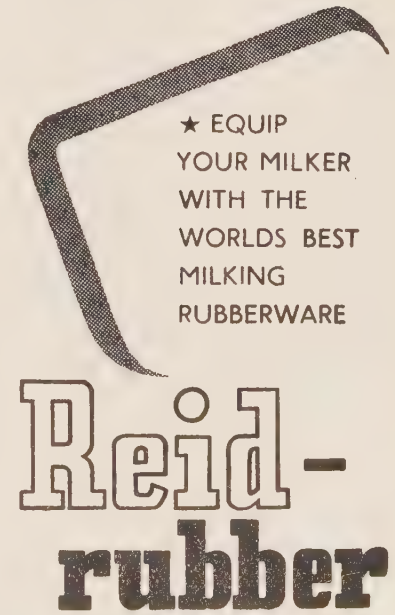
Acknowledgment

I wish to thank, on behalf of the federation, the Minister of Agriculture (the Hon. Ben Roberts) for his interest and assistance during the past year. I thank the officers of the Department of Agriculture, who have assisted us to the best of their ability in the face of their own difficulties. I particularly thank Mr. P. W. Smallfield, director of the Fields Division, whose encouragement and assistance have helped in overcoming many of our problems. I thank the New Zealand Farmers' Union, the A. and P. Association, breed societies, agricultural colleges, and research institutions for their help and encouragement. I also thank the W.D.F.U. and all other bodies and individuals who have in any way helped our movement during the past year; and I especially thank our Dominion secretary, Mr. S. Freeman, whose duties during the year have been particularly arduous on account of the additional work that he has undertaken, and whose efforts have been, in no small way, bound up with the progress that has been made.

I also wish to give my personal thanks to Mr. S. G. Avery, Dominion vice-president, for the work that he has done for me in the North Island, attending council meetings, etc., at which I was unable to be present; and to Mr. D. S. Ross, immediate past president, for his whole-hearted co-operation and assistance at all times.

In conclusion I would remind all those associated with our organisation that there is still much to be accomplished. Looking back over the record of the past year we can see a good deal upon which to congratulate ourselves; and we have the knowledge that we have definitely turned the corner, and that our movement is now on the high road to recovery. There is, however, great danger in complacency, and this is certainly no time to "rest on our oars." Rather should the feeling that we have done much towards the revival of our organisation spur us on to greater endeavour, for we cannot afford to lose any ground. We must again remember our duty to our comrades overseas and to the younger generation growing up around us. We have weathered the storm, but only by doing our utmost collectively and individually can we expect to gain the harbour of success and progress. I make this appeal to every member of our Y.F.C. organisation, club members, advisory members, council members, and all: Remember that yours is a movement of worth and value beyond conception; it has demonstrated its possibilities in the years before the war; it has carried on in the face of tremendous handicaps during the greatest crisis our Empire has ever known. Now that victory and peace are in sight do your utmost to ensure its progress, and strive to re-establish it so that it will be capable of carrying out its task—a task that we, every one of us, should be proud to be associated with, the building of a world worth living in, not merely for our own generation, but for the generations that are to follow.

(Signed) T. E. STREETER,
Dominion President, N.Z. Federation of Young Farmers' Clubs.

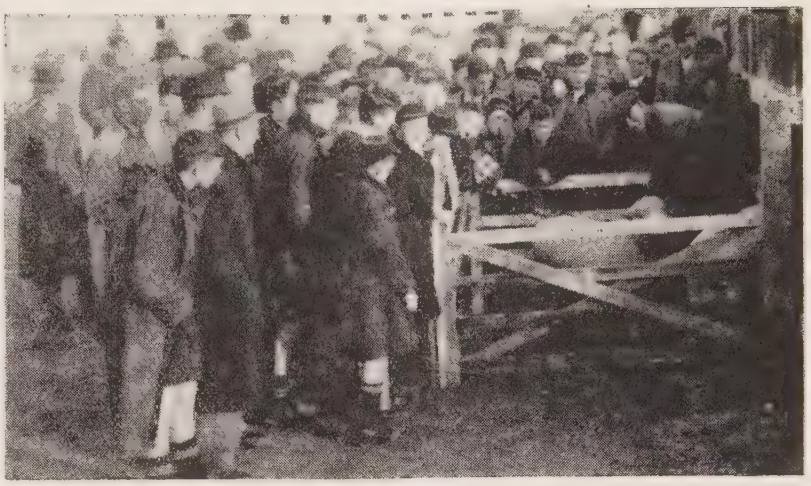


Southern Hawke's Bay Field Day

AN ambitious programme was successfully undertaken by the Southern Hawke's Bay district committee, in an attempt to promote interest in the Y.F.C. movement and revive clubs within its area. A field day was held on the Woodville Jockey Club grounds, followed by a lantern lecture in the evening.

Demonstrations on stock were staged in the afternoon, as follows:—Romney sheep (Mr. J. E. Hewitt); Southdown sheep (Mr. A. C. Swift); pigs (Mr. L. L. Marsden, pig supervisor); and dairy cattle (Mr. H. H. Phillips). There was an attendance of over 70, including a number of high school pupils, who made the journey from Dannevirke in buses specially chartered for the occasion; these lads are junior members of the Dannevirke Club. Great interest was taken in the demonstrations, which were of a particularly high standard, and the field day was brought to a successful and fitting close by a lantern lecture in the evening, given at the Oddfellows' Hall by Mr. J. Hill-Motion, veterinarian. Mr. Hill-Motion's lecture dealt comprehensively with the general ailments and diseases of livestock, and proved most instructive.

Afternoon tea was kindly provided by the Woodville branch of the W.D.F.U., and catering arrangements were made for a hot tea for the visiting members. Messrs. J. M. Murray, of Woodville, and J. Mitchell, of Hopelands, were responsible for the local arrangements. In the unavoidable absence of Mr. H. M. Poole, chairman of the district committee, Mr. W. Simmons, of Dannevirke, took charge of the proceedings. Following the lecture at night, an appeal to those interested in the Y.F.C. movement was made by the chairman of the Wellington council (Mr. S. G. Avery) and the Dominion secretary (Mr. S. Freeman). As a result of the field day and other propaganda since carried out at least one club has been stimulated to further activity, another has been definitely re-established, and a further club shows signs of a revival in the near future.



Mr. J. E. Hewitt demonstrating on Romneys.

Scholarship at Lincoln

Old Students' Grant to Y.F.C.

THE Y.F.C. Federation has been for some years past indebted to the Old Students' Association of Canterbury Agricultural College for a half-scholarship, tenable at Lincoln College, by members of the Y.F.C. organisation in the South Island only. Through the kindness and generosity of the Old Students' Association this has now been increased to a full scholarship, to the value of £55, and will in the future be available to active members of the Young Farmers' Clubs in **both Islands.** The scholarship is tenable in any one of the following courses:—

(a) The Lincoln Diploma Course.

(b) The Intensive Eight-months Course.

(c) The Rural Valuation and Farm Management Course.

These courses will commence with the 1945 year. Each club will be entitled to send in one nomination; these should be sent in to their district committees, who will make the first selection, if necessary, and forward their own final nomination direct to the federation. **Clubs should give this matter their early attention,** as it will be necessary for the nominations to be received from the district committees **not later than October 20 next.** Nominations from district committees should be addressed to the Dominion organising secretary, Young Farmers' Clubs, P.O. Box 112, Palmerston North. Remember, clubs must send their nominations to their district committees in time for the individuals to be considered and the selection forwarded by October 20. In cases where no district committee is at present functioning nominations from clubs may be sent in direct. A final selection committee will be appointed by the Dominion executive committee.

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Methven Club Field Day

(By A. A. Grigg, hon. secretary, Methven Y.F.C.)

SIXTEEN members of the Methven Young Farmers' Club attended a successful field day held on Mr. A. F. Marr's property. The field day took the form of stock-judging competitions, the classes being Border Leicester and Romney sheep. The results of the judging were as follows:—

Border Leicesters:—Angus McKay 1, Ian Wilson 2, Trevor Callaghan 3.

Romneys:—Ian Wilson and Trevor Callaghan (equal) 1, Stewart Callaghan and Clem Body (equal) 2.

Ian Wilson was awarded the cup for gaining the highest aggregate points in judging both classes.

The sheep for judging were provided by Messrs. A. F. Marr and R. J. Low. Mrs. Marr kindly entertained the visitors at afternoon tea.

Mr. A. F. Marr giving instruction in the judging of Romney sheep.

Reports on Club Activities

SOUTH OTAGO.

Warepa.—Decided to pay a visit to the Kaitangata coal mine at an early date. Mr. Taylor to speak at the next meeting on "The Maintenance of a Motor-car." Interesting talk by Mr. Crook, president of the Miners' Union, Kaitangata, on "Coal Mining." Eighteen members present.

DUNEDIN.

West Taieri.—Letter of congratulation from Outram Patriotic Committee on the club's effort in contributing £16 16s as profits from dances held during last year. Arrangements made for members to attend a demonstration of the treatment of young trees before planting, to be given by Mr. W. Crawford. Talk by Lieut. K. Reid, a former member of the club, on "New Caledonia and the Solomons." Fourteen members present out of a total membership of 18.

NORTH OTAGO.

Enfield.—General discussion and impromptu speeches. Talk by Mr. A. Forrest on "Fat Lamb Production." The speaker outlined the history of the sheep, and the breeds and types to purchase for the flock. There were 14 members present out of 15.

SOUTH CANTERBURY.

Cannington.—Mr. C. C. Leitch, Department of Agriculture, gave a talk on the "History of Seed Certification." All members were in attendance, to the number of 14. Officers elected at the annual meeting: Chairman, E. W. Hall; vice-chairman, D. Sewell; secretary and treasurer, A. W. McKenzie. There were 10 members present at the annual meeting.

Geraldine.—Three new members enrolled. Two debates held: (1) "That Arable Farming Assists the War Effort More than Grassland Farming"; speakers, R. Hammond, T. Nelson, T. Greenall, and M. Goodwin (affirmative), E. Worner, G. Harper, J. Nelson, and K. Goodwin (negative). The affirmative secured the award by 111 points to 105. (2) "Can New Zealand Be Self-supporting?" Speakers, C. Kelman, O. Neutz, A. Crotty, and T. Greenall (affirmative), K. Hibbs, I. Sheed, J. Sheed, and A. Beattee (negative). The negative secured the award in the second debate. There were 31 members present out of 33. Four new members were enrolled at the previous meeting, when Mr. C. C. Leitch, Department of Agriculture, gave a talk on "The Certification of Small Seeds." There were 29 members present.

MID-CANTERBURY.

Ashburton.—Annual meeting. Officers elected: Chairman, B. Lambie; secretary, R. Bennett; treasurer, H. Bennett; hon. auditor, Mr. J. M. Willoughby. Twenty-one members present.

Hinds.—A debate was held, the subject being "That Farming in New Zealand Should Be Declared an Essential Industry." Speakers, D. Chisnall, W. Keeley, and K. McConnell (affirmative); R. Cocks, I. Donaldson, and W. Taylor (negative). The debate was won by the negative team. Fourteen members in attendance out of 20.

Methven.—Two new members enrolled. A report was given on the club's annual ball, showing a profit of £11 19s 3d. Arrangements for the club dog trials. Subjects selected for consideration by the district secretary for the Mid-Canterbury district inter-club debate. During the evening members gave five-minute speeches for the Dunkley Cup. Mr. Dunkley also donated 10s for second prize, and Mr. A. McKay donated 10s for the best speaker under 18. The awards were made as follows: Winner of the cup, A. McKay; second prize, G. Limbrick; best speaker under 18, E. Bryden. Mr. Dunkley presented the cup and prizes. Mr. Temporo kindly acted as judge. There were 17 members present out of a total of 64.

CHRISTCHURCH.

Ellesmere.—Three new members enrolled. Profit from recent dance, amounting to £13 6s 2d, to be spent on parcels for members overseas. Lecture by Mr. J. W. McLean, of Lincoln College, on "Winter Feeding of Stock." Twenty-seven members present out of 53.

NORTH CANTERBURY.

Oxford.—This club has recently been revived. There was an attendance of 14 at the meeting, and the following officers were elected: Advisory president, Mr. J. McGrath; chairman, W. I. Croy; secretary, I. H. Thompson; treasurer, R. W. A. Reed. It was decided to hold regular monthly meetings.

Scargill-Omihi.—Arrangements for annual ball. Mr. W. H. Harris to be asked to lecture on "Tree-planting" at the next meeting. Lecture by Mr. Strachan on "New Zealand's Part in the Post-War World"; the speaker had a very interested audience and answered many questions. There were 25 members in attendance out of a total of 35.

HOROWHENUA.

Levin.—Address on Y.F.C. activities and report on the annual meeting of the council by Mr. S. G. Avery, chairman, Wellington council. Address by the Dominion organising secretary, Mr. S. Freeman, on the Y.F.C. organisation generally. Attendance of 20; three visitors attended from the R.N.Z.A.F. Station, Levin. Officers elected at the annual meeting: Advisory president, Mr. H. J. Lancaster; chairman, R. Speedy; vice-chairman, R. G. Horn; secretary, S. Lancaster; hon. auditor, Mr. F. Nicholson; advisory members, Messrs. C. E. C. Webb and R. J. Law. Twenty-five members attended the annual meeting.

MANAWATU.

Bunnythorpe.—Talk by Mr. A. W. Hudson, of Massey College, on "Mole Draining"; the speaker dealt thoroughly with the different methods of mole draining and finishing, and answered a number of questions. Among those present were Mr. H. de O. Chamberlain, instructor in agriculture, Palmerston North, and the Dominion organising secretary, Mr. S. Freeman. There were 11 members present, and a number of visitors.

Oroua Downs.—A meeting held to revive the club, which had been in recess for about two and a half years. The Dominion organising secretary, Mr. S. Freeman, spoke on the aims and objects of the Y.F.C. Federation, and Mr. S. G. Avery, chairman of the Wellington council, spoke on the Y.F.C. organisation and activities. The meeting decided to revive the club, and appointed the following officers: Advisory president, Mr. R. Craig; chairman, F. Shailer; vice-chairman, S. Boyden; secretary, M. F. Moffat; assistant secretary, M. Mills; advisory members, Messrs. J. Gray, R. Pedersen, and F. J. Moffat. It was decided to ask Mr. J. Hill-Motion, veterinarian, to give a lecture at the next meeting. There were 20 present at the meeting, and there is every reason to believe that the club will make steady progress.

Rongotea.—Talk by Mr. G. Orr on his experiences on the island of Crete; Mr. Orr was a prisoner of war for a period, and later had hidden in the caves for 11 months, prior to reaching Alexandria by submarine. His talk was of great interest and very well received. There were 20 members present.

WANGANUI.

Bulls.—An endeavour to be made to select two senior and one junior teams to compete in

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the district inter-club debate. Decided to enter for the District Efficiency Cup. Mr. S. G. Avery (who is chairman of the district committee, as well as chairman of the Wellington council), gave a report on the recent district meeting held at Mangaweka. One new member enrolled. Seven members of the club at the R.N.Z.A.F. Station, Ohakea, were present by invitation. An interim report on the recent club dance showed an approximate profit of £6. Talk by Mr. C. H. M. Sorensen, supervisor, Taranaki District Pig Council, on "Pig Production." The speaker illustrated his talk with lantern slides, and dealt comprehensively with the proper care and attention necessary during the early life of the animal; he also stressed the importance and need of greater production of pig-meat during the coming year. Fourteen members present and a number of visitors. Through an oversight no report was published of the annual meeting. The officers elected were as follows: Advisory president, Mr. A. D. Young; chairman, P. Anderson; secretary and treasurer, R. I. Jamieson. There were 15 members in attendance.

Mangaweka.—Arrangements for a dance to be held, the proceeds to be devoted to patriotic funds. Lecture on "Parasites in Sheep" by Mr. Geo. McDonald, veterinarian, Rata.

Marton.—This club has now been revived after being two years in recess. The chairman of the Wellington council (Mr. S. G. Avery) and the organising secretary (Mr. S. Freeman) addressed the meeting. As the prospects of a strong membership appeared likely, it was decided to re-establish the club. Officers were elected as follows: Grand patron, Mr. E. B. Gordon, M.P.; patron, Mr. W. Aitken; advisory president, Mr. H. G. Stewart; advisory members, Messrs. A. C. Birch, G. L. Marshall, G. McDonald, and C. J. Craig; chairman, K. G. Coles; secretary, M. F. Gray; treasurer, H. Miller. The club decided to meet again soon to arrange a programme of activities for the season.

SOUTHERN HAWKE'S BAY.

Dannevirke. Three new members enrolled. Letter of thanks to be sent to Mr. Tatere. G. Turner appointed delegate to a meeting called by the chairman of the H.B. Education Board. The secretary raised the question of the Y.F.C. memorial, and put forward a suggestion to the meeting. A sub-committee was set up, comprising the chairman, secretary, Messrs. L. Feierabend, Hill, H. M. Poole, and J. Welsh, to investigate the club's centennial trees on the showgrounds and take the necessary steps to replace the gaps. Three-minute talks were given by the following: B. McIntyre ("Draining Land"), J. M. Tickner ("Shelter on the Farm"), and A. Kennedy ("Dog Distemper"). J. L. Sunderland (secretary) gave an outline of the construction and working of the Y.F.C. Federation, explaining the functions and relationships of the club, district committee, council, Dominion executive, and the federation annual meeting. He also gave a short report on the annual meeting of the Wellington council. Mr. L. Feierabend (advisory president) explained the aims and objects of the Y.F.C. movement to the meeting. There were 33 members present.

Woodville.—A successful meeting was held with the idea of reviving the club. It was attended by the chairman of the Wellington council (Mr. S. G. Avery) and the Dominion organising secretary (Mr. S. Freeman), both of whom spoke on Y.F.C. affairs generally and made an appeal to those present to re-establish the club, which had been in recess for over two years. The meeting decided to revive the club, and officers were elected for the ensuing year. There appears to be a prospect of a fairly strong membership. Members of the Dannevirke Club were also present to assist.

WAIRARAPA.

Alfredton.—General business and allotment of trophies for events in the forthcoming dog trials. Trophies presented by Messrs. A. Napier and J. L. Heckler for Y.F.C. events. General talk by Mr. G. F. Wigginson on "The Training and Working of Dogs"; the speaker also touched on the selection of pups, etc. Seventeen members present out of 22.

Carterton.—Debate to be held with the local Farmers' Union, the subject to be "That Country Life Offers More to Youth than City Life." Club team selected: P. Gates, J. Jones, and B. Knox. The debate to be held as a public function. Mr. Bliss to be asked to lecture at the next meeting.

Masterton.—Arrangements for a dance. Mr. C. McLachlan, chairman of the Boys' and Girls' Agricultural Clubs, suggested that the Y.F.C. unite with his organisation in a field day on December 1. Address by Captain Sutcliffe on the living conditions in the East End slums of London, where he had spent several years in the Church Army Mission. Twenty-six members present out of 56.

TE KUITI.

Otorohanga.—A very instructive and interesting address was given by Mr. E. Dodson, veterinarian, to an audience of members and friends. The subject of Mr. Dodson's talk was "Seasonal Ailments of Dairy Cattle—Their Causes, Prevention, and Cure." At the close of his address the speaker answered a number of questions. There were 19 members present.

Paewhenua.—General business. Mr. T. K. Harnett resumed and completed his address entitled "Travelling in California." Eighteen members attended out of 21.

BAY OF PLENTY.

Kati Kati.—Impromptu speeches by all members present. Fourteen in attendance out of 22.

Paengaroa.—One new member enrolled. Decided to hold a dance to assist in raising funds for the Y.F.C. memorial scheme, and to combine with the Te Puke and Pukehina Clubs in another function for the same purpose. The chairman announced that both the "A" and "B" teams had been successful in the first round of the debating contest, and that the club team had won the Gulliver Cup at the stock-judging field day held recently at Tauranga. Decided to enter a team in the seven-a-side football tournament to be held shortly. There was an attendance of 22.

Tauranga.—General business. The chairman reported on the debate against Paengaroa, stating that the team had lost by only five points. It was decided to hold a "prepared speech" contest at the next meeting. Arrangements for a ball in August and a dance in July.

Te Puna.—General business. Arangements and preparation for debates. Eight members present out of 24.

Waimana.—Annual meeting. Officers elected: Advisory president, Mr. N. J. C. Macdonald; chairman, R. J. White; vice-chairman, A. Wardlaw; secretary, D. Cain; treasurer, H. C. White. This club has now become very active and is enrolling new members. A challenge has been issued to the Western Bay for the Wright Stephenson Cup. At the next meeting an address will be given by Private R. T. Whute on "Farming in New Caledonia."

Whakatane D.H.S.—The visit to be made to the Rangitaiki Dairy Factory was abandoned owing to the inability to obtain a permit for travel by bus. A trip was made to Mr. G. R. Kent's nursery. Meetings during the month were devoted to the radio talk to be given by the club on September 25. The attendance at the meetings during the period averaged 44.

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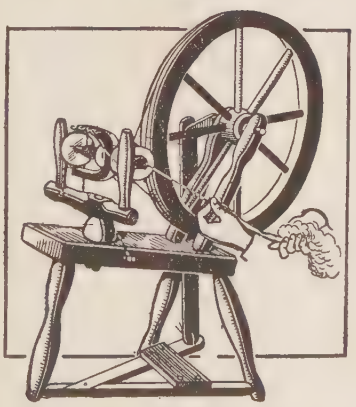

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A box 4in. x 4in. x 4in.* = 1 quart.
A box 6in. x 6in. x 8in.* = 1 gallon.
A box 12in. x 12in. x 15½in.* = 1 bushel.

* Internal measurements.

A quart tin filled, but not packed, would represent 1/32 of a bushel and the weight of the contents would be:—

	lb.	oz.		lb.	oz.
Wheat	1	14	Peas	1	14
Maize	1	12	Barley	1	6
Oats	1	4	Salt (common)	2	0
Bran		10	Pollard	0	10
Wheatmeal	1	8	Meatmeal	1	8

The weight of a cubic foot of roots in a clamp or pit is as follows:—Turnips, 33 lb.; swedes, 34 lb.; mangolds, 35 lb.; carrots, 31 lb.; parsnips, 31 lb.; potatoes, 42 lb.

Women's Land Service

British Women at War

A VERY interesting booklet, extracts of which will be of interest to all Land Service members, has just been received from the Ministry of Information, London.

Nine out of ten unmarried women in Britain between the ages of 19 and 45 are in the uniformed forces, munitions factories, or essential war work.

One in four of the married women of the United Kingdom is employed in war-time industry.

Single women in Britain between the ages of 19 and 31 have been liable to conscription for the Women's Auxiliary Forces. Recruiting was reduced to a minimum in July, 1943, for the Services and the Women's Land Army. Women are now directed principally into aircraft construction.

Behind the scenes at Britain's Ministry of Food five women nutrition experts aid in the battle of food production. Women domestic science experts staff the Ministry's experimental kitchens for testing and producing new recipes for foods in plentiful supply or for utilising new types of food.

The Women's Land Army in Britain, numbering 5,000 in 1939, has now multiplied 16 times. Recruited from volunteers, mostly without agricultural experience, women from 17 to 40 are employed on farms and market gardens, and in forests.

For women who are willing to do part-time work on the land near their homes Emergency Land Corps have been set up in most counties in Britain. Through voluntary Land Clubs other women spend their weekends and holidays in farm work.

Arrest That Rat!

IN the lovely Sussex Downs is a training school for rat exterminators. The trainees are girls of the Women's Land Army in Britain, who in times of peace worked in homes, shops and factories. They are combating the vast army of 50,000,000 rats which devour the nation's food.

The girls are volunteers from all parts of Britain and are trained by Major N. Phillips, a Ministry of Agriculture expert, one of the most successful rat exterminators in Britain. He teaches them all he has learnt in years of rat-hunting—how he recognises rat trails, how to track down their lairs, and how to exterminate them. He shows them the time-honoured method of working with dogs, then initiates them into scientific methods, which are far more effective and account for rats in thousands instead of tens.

When the girls are trained they are placed in "pools" ready to travel to all parts of their county and clear rat-infested farms and fields, and in this way assist in the war effort, as rats destroy enormous stocks besides what they actually eat.

CORRESPONDENCE SCHOOL COURSES

OPEN TO LAND GIRLS

LAND SERVICE members are advised that the same privileges are available to them as to members of the Armed Forces with respect to courses taken through the Correspondence School of the Education Department. A deposit of 10/- is required before text books are issued to pupils, but this amount is refunded when the books are returned at the end of the course.

The Correspondence School Branch has full examination courses in academic subjects, and practical courses in needlework and allied subjects, drawing, arts and crafts, also a full course in agriculture and farming. There are short or long courses.

Write direct to the Headmaster, Correspondence School, Clifton Terrace, Wellington, and mark envelope Land Service member.

Dress Uniform Measurements

AN increasing number of dress uniforms and topcoats are being returned by Land Girls as a result of being a bad fit. This necessitates the sending of a fresh measurement chart which when received is checked against the original chart and also against the garments themselves. In the majority of cases the garments are found to be a bad fit as a result of the member giving incorrect measurements on her original chart and it is very rarely that a mistake is found to have been made by the tailors.

Land Service members are asked to be very careful in furnishing correct measurements. Measurements should be tight measurements and the tailors when making the uniform will make the necessary allowances. If at all possible it is preferable that the measurements should be taken by a tailor. Any alterations necessary as a result of incorrect measurements may result in the members being charged for alterations.

Attractive Club

ONE of the most attractive clubs for women in Britain was that for Land Girls on leave in London, stated Mrs. P. Fraser, wife of the Prime Minister of New Zealand, who has just returned from overseas.

When the president of the British War Relief of America visited Britain he was greatly impressed with what the 70,000 Land Girls were doing. His enthusiastic references when he returned home resulted in two big labour organisations sending over £14,000 collected by voluntary subscription. The club and two rest-houses outside London resulted.

Mrs. Hudson, wife of the Minister of Agriculture, designed the interiors and commissioned a Danish artist to paint typical pastoral and dairying scenes in the panelled dining-room. Even the black-out shutters when closed for the night reveal charming decorative motifs.

RELAXATION

IT is of great value to be able to relax the body at will, as it saves energy, and therefore prevents fatigue. Very few people know how to relax. This is how to learn:—

Lie on your back on the floor, stiffen every muscle until you are perfectly rigid, then quickly "let go" and relax every muscle so that you are lying quite limp. Remain like this for one or two minutes. Repeat three or four times.

Pen-Friends Wanted

THE following Land Service members would like to hear from interested fellow Land Girls:—

Miss Barbara Gibson,
C/o. Miss E. Richards,
"The Point,"
Windwhistle.

Miss I. Harrison,
Upper River.
Private Bag,
Dannevirke.

THE GOOD NEIGHBOUR.

Change

THE element of change has been a particularly dominant factor of existence during the last few years. Even in this country, which is so far removed from the actual battlefront, war has wrought many changes; I doubt if there is any adult whose mode of life has remained entirely unaltered by the general course of events. The womenfolk have certainly shared in this experience: their fortitude has withstood partings and loneliness and they have borne the burden of anxiety and suffering with true gallantry, as is the way of women the world over. But their achievements do not end there. The present conflict has opened the doors to greater avenues of service, giving them access to a wider realm of affairs than any in which the majority of their sex have participated hitherto. The response has been magnificent. In medicine and education; on the land; in the industrial and commercial sphere, never before in history have women made such an important contribution to the life of the nation as they are doing to-day. Although with the advent of peace many of them will be returning to their former role of domesticity their interests will never again be limited solely to four walls, as they are now alert to the great issues confronting humanity and they realise the vital responsibilities they must fulfil in the post-war world if the future is to hold any hope of betterment for the race.

One writer said recently: "When we re-establish ourselves after the war we must get the idea that we cannot have a continuity of sameness, that we are going to have a continuity of change. We need to go into the new era convinced that if there is one thing eternal, it is change."

The manner in which we react to change in our own personal life largely determines the measure of our worth in the community. If we fuss and rail when our cherished plans go astray we not only waste our time and energies without accomplishing anything, but we often add to other people's loads. Kicking against the pricks usually does more harm than good. It is far better to accept a situation with cheerfulness and calm, and brace ourselves to make the best of it. Admirable indeed are the good-natured souls who shrug at innovations and meet the unexpected with a smile. For them variety is truly the spice of life!

Much of the reluctance with which we adapt ourselves to change is engendered by fear of the unknown. It was a woman who wrote: "Every year I live I am more convinced that the waste of life lies in the love we have not given, the prowess we have not used, the selfish prudence that will risk nothing, and which, shirking pain, misses happiness as well." Moreover, we dislike the comfort and security of our daily groove being disturbed; we are loath to forsake a familiar way of living for adventure in fresh fields. It takes quite an appreciable amount of determination to rid oneself of the shackles of settled habits and mental lethargy, especially as one becomes older, but the enrichment of personality which results from the cultivation of new interests and ideas is well worth the effort.

Changes are inevitable. Whether they are for good or ill, we cannot evade them. Though our skies may be clouded for a time we can take comfort from the knowledge that

"There's a smile in every storm we weather,
And partings are the rainbow paths that bring our hearts together.
And when we suffer, as we must, through joys as well as sorrow,
We find that nights of deepest doubt turn to a grand to-morrow."

If we regard life's varied happenings as part of the divine plan and maintain a philosophical attitude towards the ups and downs, we will gain immeasurably in understanding, tolerance, and wisdom, no matter what befalls us.

Mary

Dame Laura Knight

UNDOUBTEDLY the foremost woman artist of our time is Dame Laura Knight. After reading her autobiography, "Oil Paint and Grease Paint," one realises how richly she deserves the honours and success that are now hers. Even when a mere baby Laura was never so content as when occupied with pencil and paper, so her mother records.. Her childhood was one of poverty—an old factory ledger had to suffice as a sketch book—but as compensation there was always the joy of her developing talent. Some idea of her resourcefulness can be gained from the fact that at only 12 years of age, when due to visit relations in France, she cut out and stitched all the clothes necessary for the trip. After her mother's death she and her sister were so poor that they had only one coat between them and they often lived on a diet of porridge for long periods. At this time she was studying at the Nottingham Art School, where she met her future husband, Harold Knight. She won the Princess of Wales Scholarship and life became a little easier.

Prior to her marriage in 1903 she spent some years in the fishing village of Staithes, and the rugged scenery and primitive life of the fisherfolk had a lasting influence on her work. When she and her husband journeyed to Holland to study the art of the Dutch masters she encountered the difficulties of drawing in the traditional manner: "There has always been something inside me that does the work and tells me what I have to say." She has never lost that integrity.

Painting, poetry, ballet, drama — the greatest names in all these branches of the arts are numbered among her friends, yet she is just as much at home among the gipsies and circus performers whom she loves to paint. She writes: "I am thankful to have known the tasks and struggles of common life, joy and despair like any other mortal. I am just a hard-working woman who longs . . . to add a mite to the treasure of the world, the treasure which makes man's very existence. It is the artist's unconscious mission to make of the world a richer place, that others through his gift may share his vision."

Mend and Make-do
to save buying new

HERE ARE SOME USEFUL SUGGESTIONS

STORAGE

IF YOU have some linen which is not in use, store it away—but not in a hot cupboard and not if it is starched. For long storage wrap in paper parcels and place in a cool but dry chest, cupboard or drawer. Wash, mend and air before putting it away. Refold at intervals to prevent wear at the creases. Store only clean linen.

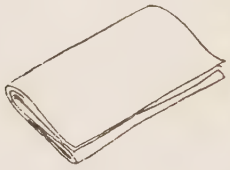
MENDING

There is a lot of wear left in linens which look worn and every ounce of wear must be got out of them.

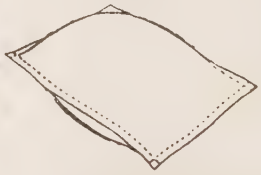
Hold sheets, pillowcases and towels up to a strong light and look through them—this will often show up tiny holes and slits—such as cuts made by razor blades, which are almost invisible before the towel is washed, but become large ragged tears afterwards. Be sure that if pillowcase buttons are hanging loose they are taken off before sending it to the wash.

When patching use old material—a new patch on a worn towel for instance is liable to tear it away.

Always mend linen before it is washed—if you haven't time to do so properly, draw it together roughly for the time being with an oversewing stitch. Thin spots should be reinforced by darning, either by hand or machine, before they actually wear into holes. A two-sided tear should be darned in both directions, so that the place of the tear is doubly darned.



SHEETS AND PILLOW CASES



When sheets get very thin, turn them sides to middle by cutting them lengthways down the centre, and either oversewing the outside selvedges together or joining them with a run and fell seam. Trim away the torn parts of what are now the sides of the sheet. Turn in the edges and hem them.

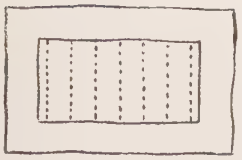
If a sheet already turned sides-to-middle has become too thin to use, wait until you have another one in the same condition, then join the two together. Place them smoothly one on top of the other, then sew them together down the centre with a row of running stitches. To prevent uncomfortable wrinkles, the sheets must be "locked" together. Do this by smoothing the two from the stitching outwards, then running another line of stitching down the sheet parallel with the first line. Do the same on the other side, spacing the lines of stitching about 12in. apart until the sides are reached. Oversew the outside edges of the sheets together and darn any small holes or thin patches through both thicknesses of material.

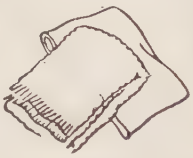
One fair-sized sheet can be made to do the work of two by cutting a line about 18in. long down the centre of the top—these edges should be hemmed. The sheet can then be used double on a small bed, the slit allowing the top to be turned back over the blankets without difficulty.

Hemstitched borders on pillows or pillowcases can be mended by tacking the two edges on to strong paper, leaving a narrow channel between, and joining the two with faggot stitch. The simplest form of faggot stitch is just a bar with the thread twisted round it.

When pillowcases get too thin to be used without risk of tearing, join the front and back together with rows of running stitching as in the illustration—then add a false back of any washing material, and slip in the ordinary way.

Bolster cases are not essential nowadays—the bolster can be covered with the lower sheet. If you are short of pillowcases unpick the seam that runs the length of the bolster, fold the material over, so that the two ends come together, and rejoin the two sides to form a pillowcase.





TOWELS

Thin places and small holes can be reinforced by machine darning or by hand darning with soft mending cotton.

Large holes should be patched with the sound parts of other old towelling — never use new material. Patches on towels should be tacked in position without the edge of the patch being turned in. These edges should then be stitched on to the towel with herringbone or cross-stitch.

If you haven't a towel rail, fix a loop to two diagonal corners of the towel so that it can be hung up without being damaged — change the loop it is hanging on from time to time—this will equalise wear—as towels are bound to be used while they are hanging on a hook.

Sew two thin tea towels together, arranging that the holes in the one are covered with the sound part of the other cloth.

When dusters wear thin, sew two together round the edge and several times across the centre.

WASHING HINTS

1. Mend all holes and tears before washing—whether they are done at home or at the laundry. If you haven't time to do a proper darn catch tears together. Laundries are working under difficulties these days and a stitch in time will be appreciated.
2. Most stains can be removed if dealt with **at once** by using plain tepid water.
3. Never let clothes or household linens get really dirty; several gentle washes are less harmful than one hard one and use soft water—rain water is best.
4. Separate whites from coloureds and soak dirty whites overnight in soapy water. Dissolve the soap in a separate jar of very hot water, to make a lather and then add it to the cold water in which the linen is to be soaked.
5. It is better not to boil linen and cottons and never boil coloureds. If whites have to be boiled and the water is hard, add soda in proportion of ½oz. to 5 or 6 gallons of hot water. Leave for a few minutes and then avoid bleaching, which is an expert's job—dry in the sun instead.

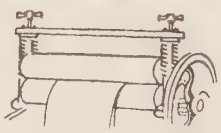
6. Wash in hot soapy water using only sufficient soap to make a lather. Note any particularly dirty parts before putting the things into the water. These can then be rubbed with hard soap.
7. Rinse thoroughly until the water is clear, and dry out of doors when possible—the whites in the sun and the coloureds in the shade. Roll up for ironing when still slightly damp.

If the things are bone dry sprinkle them with water and roll them up an hour before ironing.

IRONING

Sheets and pillowcases need very little ironing if they have been mangled after being folded into shape.

Towels need not be ironed at all; rough drying saves fuel and wear.



Always use a hot iron and plenty of pressure for ironing cotton and linen and never iron the folds.

Issued by approval of the United Kingdom Board of Trade.

HELPFUL HANNAH SAYS:

Be careful of your fingers when you break a glass. Use a damp cloth to pick up the pieces and you will save your hands from the danger of cuts.

To do away with that musty smell which a vacuum flask has when it is not often used, boil the cork in a solution of bicarbonate of soda and water.

Did you know that a small quantity of Condy's crystals added to the hot water when you are washing after a strenuous session in the garden will alleviate soreness and scratches?

Why not plastic!

Said the Lady

"Why Not?" we asked—and then our plastics experts got busy to produce to-morrow's Beater-Mixer to-day!

We present to the Women of N.Z.

THE Speedee

PLASTIC HAND MIXER

17/6 EVERYWHERE

You'll be delighted with Speedee's latest contribution to the new order in the home. The gears are totally enclosed.

PRODUCT OF

H. C. URLWIN LTD.

CHRISTCHURCH.

ART and the CHILD

I WISH every one of you could have journeyed to Wellington recently to see the exhibition of paintings done by British children. Arrangements were made for the schools to view the pictures, and every day the gallery was thronged with eager visitors. The education authorities responsible for the exhibition are to be congratulated on providing such a valuable stimulus to the cultivation of art by the young.

WHEN I tell you that the ages of the exhibitors ranged from 4 to 16 years you will have some idea of the wide scope of artistic development covered by the display. I was particularly interested in the work of the "tinies"—"Four Big Spots (and They All Ran)" (large round blobs neatly supported by life-like stems), a well-balanced composition entitled "Being Photographed," and two golden-haired maidens whose features and general appearance were so effectively portrayed that they would have done credit to an artist twice as old. I liked "Motor Car. Train" and "Policeman Holding Up Traffic," both carried out in bright reds and blues with accurate detail and a pleasing

THE FARM. J. Burgess, Bath; aged 14.

clarity of line. The seven-year-olds inclined towards portraiture, some of which showed rather futuristic tendencies, and in the pastel depicting a pair of feet pausing by a flower bed wherein a blackbird tracked down a worm amid daffodils and other signs of spring there was a praiseworthy attempt to convey a story in a picture rather than mere pictorialism. "St. Francis and the Birds," "Jack and the Beanstalk," "The Feeding of the Multitude," "Stars," and "Fire" figured in the contribution of the next age group.

It was interesting to note the diversity of subjects chosen by the older exhibitors, the trend towards realism, characteristic of the times in which we are living, being evinced by subjects like a munition factory, a ship loading, charwomen scrubbing, a street riot, a constable giving chase to sneak thieves, and people sleeping in an air-raid shelter. Those possessing a more imaginative outlook preferred such material as the return of Persephone; a jungle scene with an elephant trumpeting and monkeys swinging from the trees; Rip Van Winkle; Elijah ascending to the heavens; the bottom of the sea complete with fish, shells and strange marine growths.

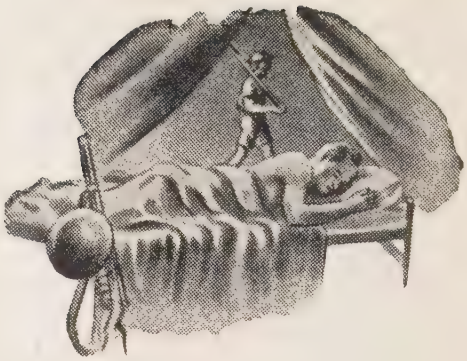
TIGERS. Audrey Chapman, Greenwich; aged 16.

There were some outstanding efforts by the senior pupils—a vigorous study of wild horses; the portrait of a boy; a still life; the dramatic grouping of tigers against a colourful desert background; and black and white sketches of a coster's fruit barrow, the occupants of a doctor's waiting room, and a trio of Victorian figures. A limited space was given over to the work of local primary scholars (which included samples of modelling and weaving) and this compared very favourably, I thought, with the achievements of their British contemporaries. The frieze of giraffes by a boy of seven and a landscape in water colour, the artist in this case being a Maori youth, deserve special mention.

Although drawing is one of the most natural forms of self-expression, there is often a reluctance on the part of mothers to give the requisite materials to small children because of the likelihood of damage to walls and furniture. How cruel to bar the entry to the magic kingdom of form and colour on this account. The best method is to provide the child with a plentiful supply of paper or some of the varied assortment of colouring books which are on the market at present and make it quite clear from the beginning that the exercise of this fascinating new activity must be confined to these articles only. It is advisable to keep a discreet eye on the first attempts, but if the matter is handled with patience and the right degree of firmness the child will soon learn to respect other people's belongings. Nor is it necessary to expend much on

WILD HORSES. Ann Rowan-Thomson, Essex; aged 14.

Twice in a lifetime



HE was just a little fellow a dozen years ago.

Too little to know—or care—that even as he slept, Frigidaire men in a distant laboratory were putting the finishing touches on a special new refrigerant later given the trade-mark, "Freon".

Much too little to understand that the real reason for developing this new compound was the safety of just such sleeping youngsters as himself.

He is grown now, and off fighting for his country on a South Pacific island. He is old enough to know that one of his deadliest enemies there is the mosquito, carrier of malaria.

The interesting thing is that it is "Freon" that now comes to his aid. Twice in his lifetime, this one result of Frigidaire research is paying off in personal protection for him and his kind.

For when mixed with chemicals to kill mosquitoes, this compound makes a new and better kind of insect spray. Unlike heavier sprays that fall to the ground, it evaporates almost instantly, leaving the mosquito-killing compounds floating suspended in the air.

"Freon" was not developed as a war product. It came about because Frigidaire, seeking to provide more and better things for more people, never stopped trying to make better refrigerators.

But because it was known and familiar, it was available when the war need appeared—just as it remains at hand for future peacetime developments.

Frigidaire

Division of General Motors (N.Z.) Ltd.

equipment. Chalks and crayons cost only a few pence and folios can be made out of whatever odds and ends of paper are handy: wrapping paper of the unwaxed variety, the reverse side of wallpaper, and even brown paper (a number of the pictures from Britain were done on brown paper!). One little boy I know, an only child and loaded with gifts by adoring relatives, had more enjoyment out of three or four coloured pencils and a pad donated by a thoughtful neighbour than all the rest of his Christmas toys put together. Admittedly, it is rather a nuisance to have to keep sharpening pencils, but a youngster soon finds out how to use them without putting too much pressure on the points, and the necessity for sharpening occurs more often than not through sheer wear!

Built-in blackboards are not always practicable in children's rooms, but an easel makes a splendid substitute and has the advantage of being movable for use out-of-doors. They are comparatively easy to make; all that is required is a simple framework hinged at the top, and with perforations midway for pegs so that the board can be raised or lowered at will, and two or three coats of black paint for the actual board itself. My own observations prove that easels are almost as popular with grown-ups as with children. The one belonging to the youngsters next door is kept in the living-room, and when I was there the other day I noticed that in addition to the embellishments of its youthful owners it bore a geometric floral design my hostess had worked out for a cushion she was embroidering; a horse's head sketched by a caller who happened to be a keen rider; a pastoral scene with rabbits in the foreground (Father's effort and in consequence much cherished by his offspring) and a surprisingly good likeness of Donald Duck by a college student. It's really rather fun to have an easel in the family!

If a child wishes to try his hand with a brush and you have difficulty in getting a box of paints, why not try the jars of liquid colours which are used for showcards? Although these are a trifle more expensive they go a long way and I can think of nothing more satisfying than splashing on those glowing emeralds and yellows, the pillar-box red and vivid cobalt. A wise mother will furnish some kind of overall so that the young artist's enthusiasm need suffer no undue repression through fear of messing up his clothes. As the child progresses he can experiment in other mediums — pastels or oils, for instance; or he may prefer to do linocuts or etchings, whatever suits his particular talent best.

Parents can greatly assist their children towards a true love of art by seeing that from an early age they have access to books with good illustrations. Every child should be familiar with the exquisite colour plates of Arthur Rackham and Edmund Dulac; E. H. Shepard's line decorations accompanying A. A. Milne's verse and prose; the animal drawings of Kiddell-Monroe, Beatrix Potter, and the American, Rudolf; Margaret Tarrant's and J. H. Dowd's delightful child studies; the delicate lithographs by M. Rojan which are such a feature of Lida's nature stories, to mention but a few examples. The Country Library Service is doing a wonderful work in this direction, making available to juveniles many beautifully-illustrated volumes, and thus fostering in the younger generation the appreciation of a high standard of culture.

There are many reasons why teachers and parents should encourage the child's practice of art, chief among them being that it not only quickens his powers of observation and imagination, helping him to interpret the beauty of the world about him, but, most important of all, it satisfies the fundamental instinct in his nature which urges him to express himself by creative effort.

DOMINION OF NEW ZEALAND

ONWARD

TO THE FARMERS OF NEW ZEALAND

THE Old Country needs all the food we can send her — food to maintain her own wartime rations, food for the invasion armies, food for the liberated peoples of Europe.

You play an imporant part in the war effort by your production of food under wartime conditions.

You can help still further by destroying all your unused meat coupons. This means NOT passing coupons on to your friends. Remember that every coupon destroyed means more meat for Britain.

ISSUED BY FOOD AND RATIONING CONTROL

HELPFUL HANNAH SAYS:

A few drops of rosewater added occasionally to a jar of face cream will prevent the cream from drying during dry weather, will make it spread more evenly, and go further, too.

BEAUTY WHILE YOU WORK

Correct posture turns every daily task into a beauty exercise. To bend with a straight back, using the pelvic 'hinge' nature provided, is a fine way to slim the hips. Also it's less tiring. Curving the spine puts a strain on the back muscles and compresses the organs of chest and abdomen, and so hampers their functioning. In no time you're tired, your back aches. Think of the number of times a day you bend . . . the wrong way! You lift a bucket, make a bed, weed the garden. Why, most of the day you're bending! Think then, of the cumulative harm to health and beauty in doing it the wrong way every time.

All posture faults—poking heads, slumped shoulders, protruding waists—add fat and subtract energy. Correct posture is worth cultivating. Once it becomes a habit it's easy. And... what it does to improve the figure simply hasn't been told yet!

Berlei knows perhaps better than any what good posture means to your better poise, your better carriage, your better health, your better figure. The Berlei five fundamental figure types are based on the truth that only the right foundation can give you good posture. Ask particularly for your right type garment now supplies are short. It's worth some effort to get.

"A Change Which Marked a Turning-Point In My Life"

FOR many of you misfortune has been the unexpected factor which has caused a major change in your affairs, and I do admire the courageous way you have faced up to adversity and turned it to good account. Marriage, that important milestone in a woman's life which points the way to a richer and fuller experience, was also the subject of numerous entries.

First prize to "Journalist" for her pithy description of the change which marked a turning-point in *her* life. "Haruru" and "Afterglow" share second place, and "Chloe" is highly commended.

First Prize

HOW would you like to be pitchforked into journalism when nearly 50, after living the usual life of women — helping mother at home, marrying, bringing up a family? Well, a crash came while my children were still at school and I had to be the breadwinner. That was the event which marked a turning-point in my life, and which opened for me a world of affairs of which I had only the most superficial knowledge. From the quiet domestic round I was "on the box-seat" at everything, big or little, which took place in the town and district. I must admit that an unusual set of circumstances gave me the first three positions I obtained in the journalistic world—pure luck that two city papers wanted outside correspondents and pure luck that I ventured to suggest some improvements to an editor and he promptly offered me the job of general reporter for the district. I didn't think it was so lucky at the time, that big jump forward, for I had absolutely no experience, but I accepted the position and crossed my fingers. I know that I acquired many grey hairs and so did a few unfortunate sub-editors, but in the end I learnt the technique of picking out the important bits, knowing where to get news, all the secrets of the game.

I have been with some of my papers for 15 years and I have learnt more during these years than during all the rest of my life. I've learnt to respect and admire the men who spare no trouble to present "hot" news with your breakfast. I have even learnt to bless the calamity that overwhelmed me, for out of it has come these wonderful years.—**"Journalist."**

Second Prize (Equal)

I HAVE often wondered how many of the farmers' wives who write in the pages of "The Good Neighbour" and in the women's pages of other farm journals are ex-schoolteachers. Quite a high percentage, I should think. Thus the change which marked a turning-point in my life is probably similar to that of a number of other "Good Neighbours." I went to teach in a small country school and met a certain farmer in that district. What a change it is for a town girl to become a farmer's wife! All the things she has to learn, and all the things she has to unlearn! A farmhouse cannot be run just like a town house and even if the girl knows a little of housekeeping she will find she has to alter her methods somewhat to suit farm conditions. There are cows to milk, pigs to feed, fowls, ducks and young animals to care for; one has to learn to tolerate mud and inconveniences, to do without pleasures and things one had previously thought of as necessities.

It was a big change in my life to come to our farm and that first year I had many a weep occasioned by tiredness and disappointment at failures. But I am glad of that turning-point in my life, glad at the fresh air and free life of the country, proud of the improvements we have worked so hard to make and the success we are so slowly winning. Still, I do love to teach my little fellows and am particularly glad of my knowledge of child psychology.—**"Haruru."**

Second Prize (Equal)

MY life has always had a way of reaching corners unexpectedly, turning right upside down and leaving me to pick up the pieces. It started doing things like that when I was still at school. Here is my first experience. One evening, during an autumn that was exceptionally hot and dry, my brother and I arrived home after our five-mile ride from school a little more tired than usual from some expedition, and tumbled happily into bed as soon as tea was over. We wakened three hours later to find ourselves in the midst of a bushfire whipped to a raging inferno by a cyclone. Shortly after we had made our escape from the house it went up in flames, along with our books and toys and all our treasures. Even my pet calf didn't survive. A night of deadly peril, wherein three other people lost their lives, left us feeling sad and confused, to say nothing of our unhappiness when our parents decided that as everything had gone up in smoke they would make a new start in another province. Ever since I could remember I'd always lived in the King Country. The folks we knew were very friendly and warm-hearted; they were concerned with the welfare of their neighbours. People came and went to the various mills, so we were all used to meeting and mixing with strangers.

Competitions.

September

Don't forget to let me have your recollections on the subject of "Strange Dreams" by September 15.

October

All of us look forward to the mail arriving. We scan the various envelopes hopefully; among the yield of bills and circulars perhaps we may find a familiar handwriting which means news of a loved one. Everybody has received good tidings by post at one time or another, so it should not prove difficult to describe a communication of this nature and its effect on us personally.

"A WELCOME LETTER"

The first prize is 10/- and the second 5/-, the entries closing on October 15.

"MARY,"
C/o. "Journal of Agriculture,"
P.O. Box 3004, Wellington.

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a valuable food as well as a rising agent!

Before the war, N.Z. baking powders were solely 'rising' agents. In Britain and America, however, these old type baking powders had already been superseded by the new phosphate baking powders. The reason was simple and sensible . . .

FOR BETTER HEALTH. Phosphate baking powders add phosphate to the food. Phosphate is vitally necessary for strong bones and teeth, and nervous and physical tone. It is especially important in the diet of growing children. N.Z. soils, and therefore, foods, are lamentably deficient in phosphates. So the change to phosphate baking powders in this country is immensely important. Cooking enriched with phosphate baking powder is going to mean better health.

FOR BETTER COOKING. Home science experts and cookery demonstrators throughout the country were asked to test the new perfected phosphate baking powders as made by New Zealand manufacturers. Read the report of one of them:

Dear Sirs,

I have pleasure in acknowledging receipt of the sample tin of baking powder which I have duly tried out in the making of scones, sponges, cakes, etc., with excellent results.

Well, there you have the opinion of a well-known cooking demonstrator. The 25 other cookery experts were equally enthusiastic in their praises.

So try the new Baking Powders yourself. Just buy your usual brand because all the reputable Baking Powder manufacturers are now using Pure Food Phosphates, and the word "Phosphates" is listed among the ingredients on the reverse side of the label. One tin will convince you that Baking Powders based on Pure Food Phosphates supersede any you have ever used before.

Pure Food Phosphate for Baking Powder Manufacture is a product of Albright & Wilson and is distributed in New Zealand by Imperial Chemical Industries (N.Z.) Ltd., 16 The Terrace, Wellington.

The upheaval was complete when we found ourselves transplanted to a small isolated country township on the coast. It was not yet served by the railway and in winter the roads were a sea of mud. The last place I would have chosen myself! Cut off from easy access to the outside world this community had grown reserved and full of little cliques. They said, "No, we don't 'cotton' to strangers easily." At school I felt like a museum oddity! How I missed my old hockey team. Shy and perhaps supersensitive, I stayed outside the various groups for ages; I just couldn't butt in and be rebuffed. Time changed it all, of course, and eventually I found nice people and other new ones came. But I think this experience gave me a lifelong realisation of what **not** to do and of how different the reception of newcomers in our midst should be. I would have their "turning-points" in our direction happy ones from the very start.—**"Afterglow."**

Highly Commended

SOME great man said, "Happiness depends more on what is within than what is without us." I found this to be true at the turning-point in my life. For years I had sought contentment in some adjustment in the circumstances of my life, not realising that to achieve tranquillity the change must come from within me, not from without. Being undisciplined and almost completely dishonest with myself I found it more and more difficult as I grew up to cope with the problems which all of us encounter in normal grown-up life.

I crashed badly and then came the turning-point when a wise doctor, now famous, began the process of re-educating me thoroughly in the only way to live successfully. Through his teaching I found that the most important thing in life is to be honest with oneself above all things—that is, honest about one's hates, jealousies, desires, and fears. I attained tranquillity by no sudden adoption or conversion. Each time I came to a hurdle which seemed too high I'd say to myself: "I'm scared of crashing, but I won't be a coward. I'll give it a good try."

Through experience I found that as long as I was completely honest I was safe. I could handle each situation as it arose. The reason for this is a simple one: when we admit to ourselves our resentments, jealousies, etc., we are in control, "captain of our ship." When we suppress any one of these emotions and sit firmly on it this results in it being liable suddenly to force its way up and our own control is lost. Each of my experiences, also the way in which I handled them, added something to my knowledge of how to live. I knew very soon that it is no use shirking experience. We must accept what comes and remember that the difficult and even heart-breaking things are what **make** people. Those who meet only easy things in life remain undisciplined and never grow up.—**"Chloe."**

THE change which marked a turning-point in my life came when I married. Gone were the carefree days when one lived to enjoy the more or less frivolous things of life and cast all care to the winds. I now had sole responsibility for a home where housewifely instincts could develop to the full. I was given the strength to nurse my children through many sicknesses and in so doing my sympathy and understanding of others' needs became greater. A mother's hands cannot lie idle long these busy days, but I do not complain, for to be given the task of guiding little lives and fitting them for a new world to come is a charge of which I am immensely proud.—**—"Happy Farmer's Wife."**

WILDLY galloping horses; a stream to cross; bird-song, trees, flocks and herds—picture the country child going to the little school, glad to get the task of lessons done and be out-of-doors again. The journey to a big secondary school, the wearing of uniform, everything done to a schedule —imagine the change. It altered a happy-go-lucky youngster into a serious-minded student. How I hated it, the stiffness, the lessons, and how glad I was to get home at night and take off that tie! But now as I write I am thankful for that college period, the new avenues it opened, the new friendships, the contact with town dwellers whose opinions were so different from my countrified ideas. Yes, the change occasioned by my college days mapped out an entirely different future for me.—**"M."**

SOME years ago my husband had to give up our lovely home and farm. I had had everything for which a woman could wish. Then came this misfortune. Our new home was a very different kind of place; we had no friends and were very poor. Before long neighbours began to call, pleasant folk wishing to make friends with us, but I still felt quite out of place. Then unexpectedly one day an old man 70 years of age performed a particularly kind service for me and from that day I made up my mind that I, too, would try to do a kindness for someone. This I have done hundreds of times over, and not counted the doing, and it has given me much happiness. Where I had lived previously it was ceremony which mattered most, but here, through the kind folk about me, I have learned to walk humbly and to value kindliness.—**"Poppy."**

THE POWER TO CHANGE

IT IS a significant fact that in the lives of men of genius the reading of two or three books has often provoked an immediate and striking expansion of thought and power. Samuel Johnson, a clumsy boy in his father's book-shop, searching for apples, came across Petrarch, and was destined henceforth to be a man of letters. John Keats, apprenticed to an apothecary, read Spenser's "Epithalamium" one golden afternoon and from that hour was a poet by the grace of God. In both cases the readers read with the imagination, or their own natures would not have kindled with so sudden a flash. The torch is passed on to those only whose hands are outstretched to receive it.

—HAMILTON MABIE.

BELIEF

"There have been wars before, but they can't destroy us. They can change the plan of our lives, they can kill our bodies, but our spirit, our faith, our ideals — those things can never be destroyed."

—A mother speaking, in a short story by M. Cheavens.

UNCHANGEABLE

Heart, everything must pass:
The growing, blowing grass,
The lilac and the rose;
Ah! whither, no one knows.
But this we know full well—
A Power invisible
Bids the bright tulip's cup
To fold and crumple up;
Tells the white lily to fade,
And birds in wood and glade
To fly to the deeper shade.

We know not—yet we know
How swiftly these things go;
How sunsets faint and perish,
And everything we cherish
Passes, a fragile dream,
Like rainbows in a stream.
All the great lovely host
Of the earth goes like a ghost.
Yet the stars, high, high above,
And the moon, clean as a dove,
And the sun—these last . . .
And our love!

—C. H. TOWNE.

Beauty, strength, youth, are flowers but fading seen;
Duty, faith, love, are roots, and ever green.

—GEORGE PEELE.

"I'm going home to Mother"

"My war work ends to-morrow, and Bob is due home any day now, so Mother and I are getting busy building a nest for us youngsters. And one of Mother's "musts" is Air-Cell or Onehunga Blankets. Since her mother's day Onehunga products have been top favourites in our home, and she won't let me start a home without Onehunga quality."

That day will come for us all, and when it does the Onehunga Mills, for so long weaving for war, will have available again full supplies of these famous woollens which have been the choice of New Zealand housewives for over three generations.

ONEHUNGA

ONEHUNGA BLANKETS —— AIR-CELL BLANKETS —— ONEHUNGA WOOLLENS & TRAVEL RUGS. Distributors: SARGOOD, SON & EWEN LTD.

Are Your Nerves on Edge?

UNDER the stress and anxiety of wartime living that upset we know commonly as nerves has become a special problem. How often do we hear people complain that their nerves are on edge, or that they are nervy, and blaming their unhappy condition on their so-called "ragged" nerves.

It's an understandable condition, and one can't help but feel sorry for those suffering from it. At the same time, though, there's really no need why a state of nerves should be allowed to

Contributed by the Department of Health

continue. We're all inclined to be a bit nervy at times, but as a rule we manage to throw off our worries pretty quickly and forget about them. It's quite natural, for instance, for a person to be desperately worried about a loved one who is in danger, and some of us have our own private fears, such as fear of being looked at, fear of being in a small room, fear of the dark, and so on. Again, many of us find that as a result of some illness, strain, or anxiety the habit of worrying grows on us. Perhaps we belong to that class known as natural worriers. Things get on our nerves—we worry too much over slights, disappointments, and lost opportunities; we begin to feel that nothing will go right with us and that circumstances and people are against us. We may even lose our self-confidence, and loss of self-confidence is a very serious business. The position gets progressively worse, and we get depressed and often a little bitter; we lose interest in our hobbies; nothing seems worthwhile.

It's a dangerous condition to get into. The outlook is bleak and miserable, and our melancholy state of mind may lead to vague aches and pains, stomach trouble, and faint turns. In other words that state of mental despondency breaks out in physical symptoms.

Forms of Fear

Now there's nothing to be ashamed about in this. It doesn't mean that we are weak or foolish, and that we are going off our heads. This unhappy period will pass in time, but we've got to do something about it. Actually, worry and anxiety are forms of fear. Consequently, the thing to do is to take a firm hold of ourselves and find out what we're really afraid of, and why. Look the trouble fairly and squarely in the face, and get it in its proper perspective—not in that distorted perspective that magnifies the image and gives it false values and an exaggerated significance.

If you're a "nervy" subject get hold of your doctor and confide in him freely. Ask for an examination and general overhaul to find out if there is any physical cause for that "state of nerves." If he can't find any such cause and remove it, then he may be able to give you advice which will solve your difficulties. But whatever assistance you may get from others—and that assistance can be of real value—much will depend on how much you do to help yourself.

Help Yourself

Up to a certain point it's up to you to work out your own salvation. You may find when you get to the bottom of your anxiety that you can do a lot to overcome it. It may be that you are conscious of your faults and your weaknesses—over-conscious in fact. But just stop and reflect that everyone has some failings and there are many people with faults worse than yours. Again look at it another way. While you're striving to overcome those weaknesses and faults—generally very much exaggerated when you're in a depressed state of mind—try thinking about some of your virtues.

If you awaken at night try not to be distressed. Wakeful nights leave you tired and exhausted in the mornings, and usually more despondent than ever. It's not the wakefulness that makes you tired, it's the worry. You must deliberately try to think of pleasant and happy things, and thus rid your mind of despairing anxiety. It requires an effort, admittedly, but it's well worth it, and you'll be surprised how quickly the habit of switching the mind to pleasant thoughts becomes developed.

Another way of easing the mind is to tell someone you can trust about your troubles. There are actually people in the world who make a profession of listening to other people's worries and giving them advice. Again, if you're afraid of a new job, for instance, or of going into new surroundings, or meeting new people, you can often overcome that complex by deliberately going out of your way to find new experiences. The best way to tackle these bogies of the mind is to square up to them and analyse them. They're seldom as bad as they seem.

MUSIC

Music stirs the spirit and can lift us up
on wings
Far above our own small lives and mere
material things.
Rising up triumphant, we are gods, untrammelled, free,
For a little while transcending our mortality;
Mystical, evocative, soaring to the height
Leading into undreamed heavens of
delight.
Yet what is it? Just arrangements of
eight different notes
Put into the air from instruments or
human throats,
Made into a pattern to create a melody
In accordance with the perfect laws of
harmony.

—Author unknown. (From *Peggy, Pleasant Point).*

Faith

. . . When you come back again
Skies will weave their spell of blueness
Over all the yearning, all the pain
That strayed into prayers for your return.
War has cast dark sorrow o'er the world,
But God will give us happiness to-morrow
When together once again, we face fair
skies.

—MARY WATERS.

GOOD-BYE

Good-bye! Is any word so full of
poignant meaning
To both high and low upon life's way?
It fills the heart with grim foreboding,
The eyes with tears which will not pass
away.
Good-bye! That sad knell rings
through many a heart
When time draws near for them to
part.
For some it may be just "farewell";
For others, as long as life doth last.
Ah, who can tell?
There have been partings since life
began upon this earth . . .
We often wonder why in the midst of
happiness and mirth
We have to breathe that saddest of all
words, "Good-bye."

—EMMIE NATTRASS.

Expectancy

Awakened when the first faint morning
light
Is breaking through the shadows of the
night,
I hear a bird sing happy songs of praise,
As if to say: "This is the day of days."
Light breaks upon my spirit as he sings—
Who knows within this day what happenings
May change the course of Fate and bring
to me
My own glad hour of hopeful ecstasy!

Mary's at - Home -

I HAVE just made a coat for my four-year-old out of one of uncle's. It looks quite nice and is beautifully warm and I am quite proud of my achievement. Somehow, I seem to gain more satisfaction from making a garment from something old than from cutting it out of new material. I suppose it is all the planning and scheming this necessitates which gives me the feeling that I have thus done something worth while.—**"Hopewell."**

I FOUND this in a scrapbook: "When alone we have our thoughts to watch; in our families, our temper; in society, our tongues." Remembering these words I think we will do much to improve not only ourselves, but also the world in which we live.—**"Roundabout."**

LIVING where wood is our chief fuel it was a problem to find storage space in the house for sufficient quantities for the day's supply. Then one of my menfolk had a brainwave and made a wide chest of red pine. This was stained and varnished and fitted with castors, resulting in a fine piece of furniture for the living-room. All we have to do is to wheel it to the back door and fill it with two-foot lengths, and not only does it serve as a wood-box, but can be used as a table for the tiny tots when there is an invasion of grandchildren, or with cushions it provides extra seating accommodation.—**"Grannie."**

I LOVE to sit by a fire of brightly burning branches with my pad on my knee and my pen in my hand and write letters. I have always loved writing as well as receiving letters and at one time had as many as 27 penfriends. I have been writing to one of them for close on 20 years. Many of my other friends are now far away, yet by writing to them I still share their joys and sorrows and remain as close to them in friendship as ever.—**"Emma."**

MAY I present a plea for more children in each family? I feel privileged to be a mother and for that privilege I gladly pay. A mother's job is surely to make a happy home for her children. I think that public life for women should come **after** their homes are cared for efficiently and their families properly fed. (No doubt in many cases this is so.) I agree that mothers should have outings and read good books. I don't believe in mother being a drudge; let her organise her family into a "working bee." As mothers it is our privilege to be that important part of home and all that it means.—**"Teragram."**

Such is the state of life that none are happy but by the anticipation of change. The change itself is nothing; when we have made it the next wish is to change again.

—DR. JOHNSON.

Just as our Army, Navy and Air Force protect these shores from attack by the Japanese "vermin," so does Gibraltar Board protect N.Z. homes against attack by Vermin, Borer and White Ant.

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J.A.

POTATOES—
with advantage at every meal

IN most households potatoes figure daily on the dinner menu, being regarded as a staple article of diet, and rightly so, for they contain a large amount of vitamin C and are a source of iron and vitamin B also. The belief that potatoes are fattening is quite untrue, as they comprise about 75 per cent. water and their starch content is approximately 12 per cent., yet they have a high energy value and, unlike other starch foods, such as bread, cereals, etc., they give an alkaline reaction.

Potatoes should always be cooked in their skins; you can skin them afterwards if you desire to mash or cream them. Even when roasting them with the joint it is not necessary to peel them; as long as they are dried well after washing they will brown successfully, and their flavour is delicious. Steaming is another good method of cooking potatoes. However, if you prefer boiling them remember to have the water at boiling point before placing them in the saucepan; this helps to guard against the loss of valuable vitamins.

Baked, boiled, fried, creamed—no other vegetable lends itself to such a variety of uses as the potato. It can even form one of the main ingredients in cakes and biscuits, pies and puddings. These recipes have been specially planned to show you how potatoes can be served with advantage at every meal without in any way becoming monotonous.

POTATO SOUP.

2lb potatoes, water to cover, 1 onion, parsley, 1 pint milk, salt, and pepper.

Wash the potatoes thoroughly and place in a saucepan and cover with boiling water. Add the onion finely chopped and cook with the lid on till the potatoes are soft. Remove the skins and rub the potatoes through a wire sieve. Return them to the saucepan, add the water in which they were cooked, also the milk and seasoning to taste, then heat slowly, without reboiling. When serving sprinkle chopped parsley thickly on top of each helping.

POTATO DUMPLINGS (SAVOURY).

1½ cups mashed potatoes, 1 teaspoon baking powder, 2oz grated cheese, ¼lb flour, ½ teaspoon salt, 2oz beef dripping or lard.

Sift the flour and rub in the dripping, then add the mashed potatoes, salt, grated cheese, and baking powder. Mix together lightly with sufficient water to form a firm dough. Drop in spoonfuls on top of a stew, replacing the lid and allowing the dumplings to cook in the steam for 25-30 minutes. If the stew is in a casserole leave the lid off and allow them to cook for the same length of time in a moderate oven, so that they will be brown on top.

POTATO CASSEROLE.

To every pound of potatoes allow 1 onion, 3 medium-sized carrots, and 1lb of fish. Bottled tomatoes or tomato pulp, seasoning, knob of butter.

Wash and slice the potatoes, carrots, and onion. Remove the skin and as many bones as possible from the fish and cut into cubes. Arrange alternate layers of potatoes, fish, onion, carrots, and seasoning. If tomatoes are available slice them and place them on top, using the liquid in which they have been bottled to half-cover the contents of the casserole. If tomato pulp is used pour over sufficient to reach the half-way mark on the dish and finish off with a layer of potatoes. Dot with butter, cover with the lid, and cook in a moderate oven for 1 hour.

POTATO BALLS.

2 cups mashed potatoes, 1 egg, a small quantity of grated cheese, salt and pepper.

Season the potatoes and make sure that they are mashed smooth. Beat in the egg, then shape them into balls and dip them in grated cheese. Place

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on a greased tray and bake in a hot oven for 20 minutes. These make a tasty accompaniment to a salad.

SEASONED POTATO PUDDING.

3oz grated raw potato, 2oz grated raw carrot, ½ teaspoon baking powder, 3oz flour, 1oz cocoa, 2oz sugar, 2oz butter, ¼ teaspoon baking soda, milk and water for mixing, pinch of salt.

Sift the flour, and rub in the butter. Add the grated potato and carrot, then the salt, baking powder, sugar, and cocoa. Dissolve the baking soda in 1 tablespoon of warm water and stir it into the mixture, adding sufficient milk and water till the mixture has reached a spongy consistency. Then pour it into a greased basin and steam 1½ hours. Serve with chocolate sauce.

HOT OR COLD POTATO PUDDING.

¼lb grated raw potatoes, 1 egg, 1 teaspoon baking powder, 2½oz butter, ½ teaspoon spice, ½ teaspoon nutmeg, 3oz sugar, 3oz sultanas, 6oz flour.

Sift the flour and rub in the butter, then mix in the remaining ingredients, adding the egg last and beating the mixture well. Pour into a greased baking dish and cook in a fairly hot oven for ½ hour. If serving this pudding hot make a custard to go with it, but if you prefer to eat it cold a thin icing and chopped walnuts add to its appeal.

SPICED POTATO FINGERS.

3oz mashed potato, 1oz sugar, 1½oz golden syrup, 3oz oatmeal, ¾ teaspoon ground ginger, ½ teaspoon cinnamon, ½ teaspoon baking powder, 1oz butter or beef dripping.

Rub the butter into the oatmeal, add the smoothly mashed potato and other dry ingredients, stirring in the golden syrup last so as to form a stiff dough. (The syrup should be warmed slightly first.) Turn the mixture into a greased baking tin and pat out to ¼in. in thickness, then bake in a moderate oven till golden brown and firm (about ½ hour). Cut into fingers when cool.

POTATO PIE.

6 potatoes, 2 onions, ½ pint milk, ¼lb cheese, 1 cup breadcrumbs, salt and pepper, small knob of butter.

Wash and slice the potatoes thinly, then peel and slice the onions. Grate the cheese, mix it with the breadcrumbs and salt and pepper. Place a double layer of potatoes in a pie-dish, followed by a layer of onion and then the cheese and breadcrumb mixture. Continue till all the potatoes are used, reserving enough of the cheese mixture to form a thick topping. Pour the milk over, dot with butter, and bake in a moderate oven for 1-1¼ hours.

POTATO PANCAKES.

¾lb dry mashed potatoes, ¼lb flour, pinch of salt, jam or golden syrup.

Sieve the potatoes, then work in the salt and flour till the mixture forms a smooth dough. (It may not be necessary to use the full quantity of flour.) Divide into 4 or 5 portions and then roll out into rounds slightly smaller than the size of your frying pan. Fry in fat at a low heat till golden brown underneath, then turn the pancake over carefully and brown the other side. Spread with jam or golden syrup and serve piping hot.

POTATO PASTRY.

½lb mashed potatoes, ½lb flour, 2½oz butter or beef dripping, 1 teaspoon baking powder, pinch salt, water to mix.

Sieve the potatoes. Sift the flour and the salt and rub in the butter or dripping, then add the potatoes and baking powder. Mix to a firm dough with a little water. Roll out on to a floured board.

POTATO ROLLS.

1lb mashed potatoes, 1oz butter, or beef dripping, 2oz breadcrumbs, ¼ cup milk, salt and pepper.

Sieve the potatoes and lightly rub in the butter or dripping, add the breadcrumbs and salt and pepper to taste, and lastly the milk, beating the mixture till it becomes smooth and creamy. Divide it into suitable portions and shape into oval rolls. Bake in a moderate oven till brown.

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HOW FAST CAN ROADS BE BUILT?

How fast can a road be built? A mile in a week used to be called good in peacetime. But in North Africa the Army Engineers have smashed all previous records to smithereens. In the course of that campaign, they learned to fling roads across the desert at four miles an hour—as fast as men can march!

Leading the swift advance of these pioneer road teams are "Caterpillar" Diesel Tractors with bulldozers, filling gullies and stream beds. On their heels come more tractors or tanks, pulling heavy "V" drags that do the rough grading. And behind them, "Caterpillar" Diesel Motor Graders move steadily forward, finishing the job.

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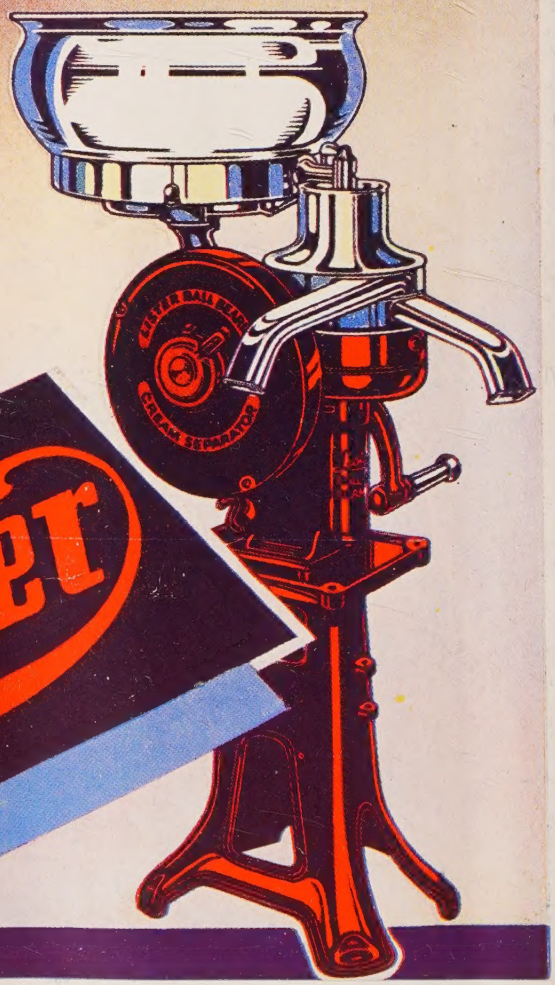

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